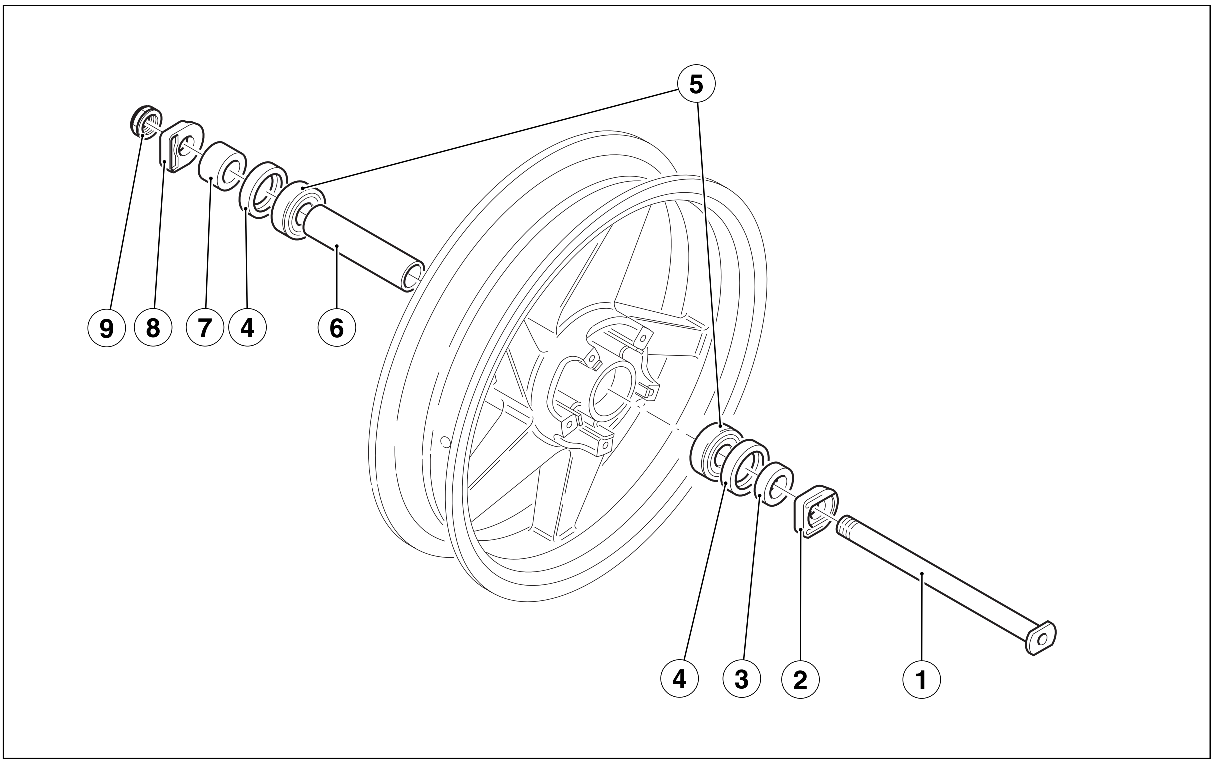
7.6. REAR WHEEL

7.6.1. REAR WHEEL DIAGRAM



Key

10. Rear wheel spindle
11. Left chain slider
12. Left outer spacer
13. Rear wheel oil seal
14. Rear wheel bearing
15. Rear wheel inner spacer
16. Wheel right outer spacer
17. Right chain slider
18. Rear wheel spindle nut

NOTE *Grease the wheel spindle (1).*

7.6.2. REMOVING THE COMPLETE REAR WHEEL

Read 1.2.1 carefully.

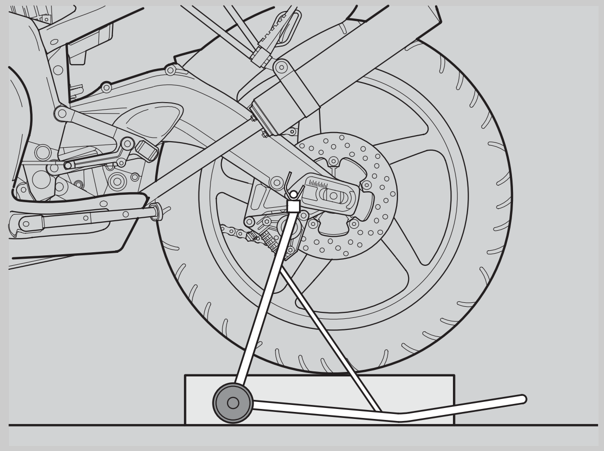
TORQUE WRENCH SETTINGS

Wheel spindle nut (1): 100 Nm (10.0 kgm)

WARNING
To avoid the risk of burns, allow the engine and silencer to cool down completely before proceeding.
Use great care during removal, to avoid damage to the brake line, brake disc and brake pads.

NOTE *Be sure to have the rear wheel stand ready at hand before proceeding to the remove the rear wheel.*

- Place the motorcycle on the rear wheel stand; see 1.7.2.
- Place a support under the tyre to hold the wheel in position once released.



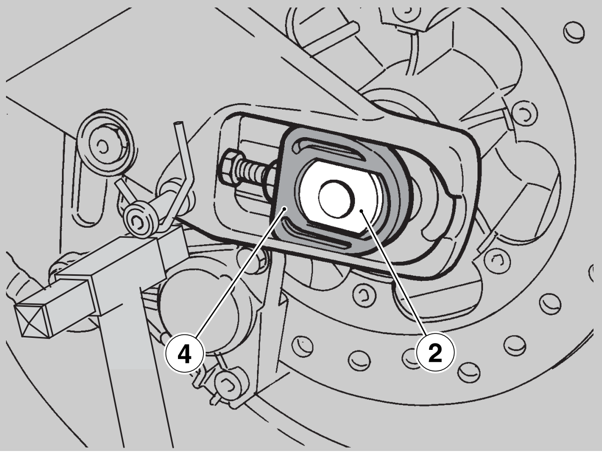
- Undo and remove the nut (1) and collect the washer.
- Withdraw the wheel spindle (2) from the left-hand side.

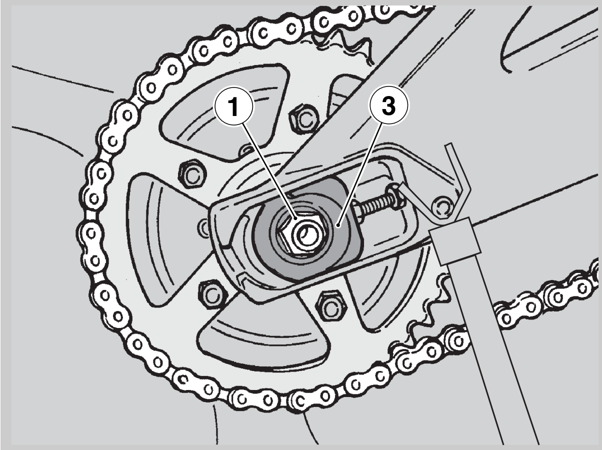
NOTE *Mark the positions of the right (3) and left (4) chain tensioners to refit them in the original position.*

- Collect the right (3) and left (4) chain tensioners.

NOTE *Take the chain off the rear sprocket routing it outboard of the sprocket.*

- Push the wheel forward and release the drive chain from the rear sprocket.
- Slide the wheel off the swinging arm in a rearward motion. Be careful until the brake disc is clear of the caliper.

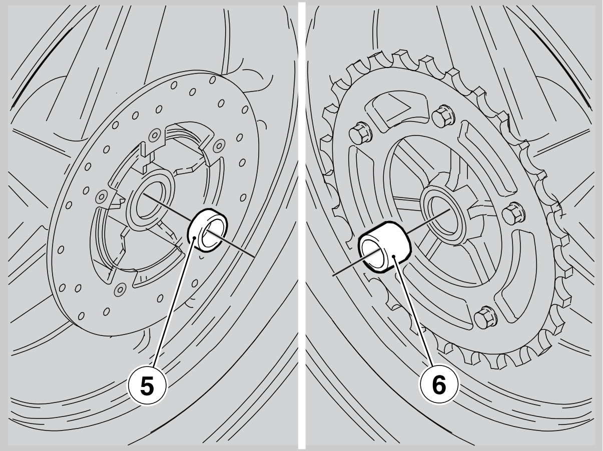




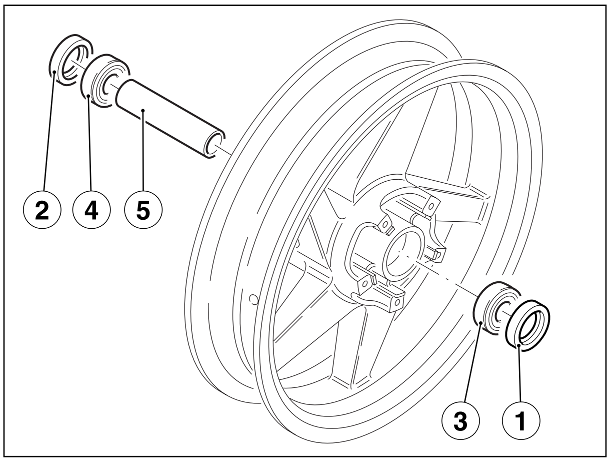
WARNING
Do not operate the rear brake lever when the calipers are not in place, or the pistons might fall out leading to brake fluid spillage.

NOTE *Note the positions of the spacers (5) and (6) so as to refit them in the original position on assembly.*

- Collect the left-hand spacer (5).
- Collect the right-hand spacer (6).



7.6.3. REAR WHEEL DISASSEMBLY



Read ☞ 1.2.1 carefully.

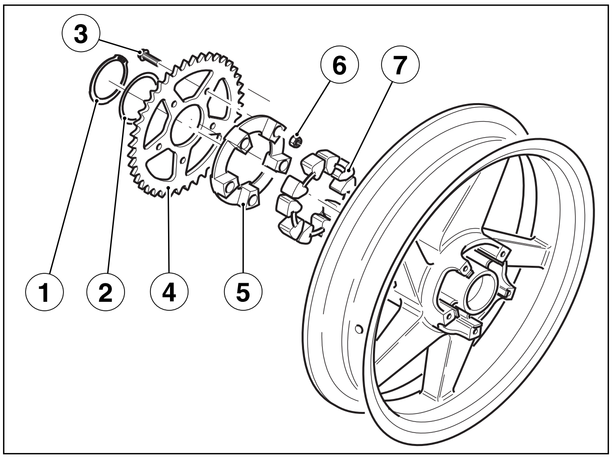
- Remove the rear wheel; see ☞ 7.6.2.
- Clean the wheel hub at both ends with a cloth. Remove the oil seals (1-2).
- Remove the right-hand bearing (3) and then the left-hand bearing (4) using a bearing extractor.

⚠ **WARNING**
Inspect the bearings after each removal and replace as required.

- Collect the inner spacer (5).
- Clean the hub bore thoroughly.

NOTE *Wash all components with clean detergent.*

⚠ **WARNING**
Refit the bearings using a drift with the same diameter as the bearing outer ring.
Do not tap the balls or the inner ring.
Push the left-hand bearing (4) fully home.



7.6.4. FINAL DRIVE REMOVAL

Read 1.2.1 carefully.

DISASSEMBLY

- Remove the wheel; see 7.6.2.

***NOTE** If you only need to remove the rear chain sprocket, simply perform the following five steps.*

- Clean the wheel hub at both ends with a cloth.
- Remove the circlip (1).
- Remove the snap ring (2).
- Release and remove the five screws (3).

- Remove the rear sprocket (4).
- Clean the hub bore thoroughly.

***NOTE** Wash all components with clean detergent.*

If needed:

- Remove the sprocket carrier (5) and collect the five nuts (6).
- Remove the cush-drive rubber (7).

REASSEMBLY

- With the sprocket carrier (5) removed, fit the rear sprocket (4) to the carrier and tighten the five nuts (6).

WARNING
Tighten the nuts in a cross pattern.

- Refit the cush-drive rubber (7) into the wheel.
- Refit the sprocket carrier (5) together with the rear sprocket (4) to the wheel.
- Refit the snap ring (2).
- Refit the circlip (1).
- Refit the wheel; see 7.6.6.

7.6.5. INSPECTING THE REAR WHEEL COMPONENTS

WARNING
Check the condition of all components. Pay particular attention to those listed below.

BEARINGS, SEALS, WHEEL SPINDLE and WHEEL RIM; see ☞ 7.5.4.

CUSH-DRIVE RUBBER

- Inspect the cush-drive rubber for damage or wear. Replace as required.
- Fit the cush-drive rubber into the wheel hub.
- Position the complete final drive assembly to the wheel. Rotate the rear chain sprocket manually in both directions and check cush-drive play in the hub. If you feel too much play, change the cush drive.

REAR CHAIN SPROCKET

- Check the toothing of the front and rear chain sprockets for wear. In the event excess wear is found, replace front and rear chain sprockets and drive chain as a set; see ☞ 7.6.4 and ☞ 7.13.1

WARNING
Drive chain and front and rear chain sprockets must always be replaced as a set. Failure to do so will lead to early wear of the newly fitted component(s).

TYRE

- Check tyre condition; see ☞ 2.19.1

7.6.6. REFITTING THE COMPLETE REAR WHEEL

Read 1.2.1 carefully.

TORQUE WRENCH SETTINGS

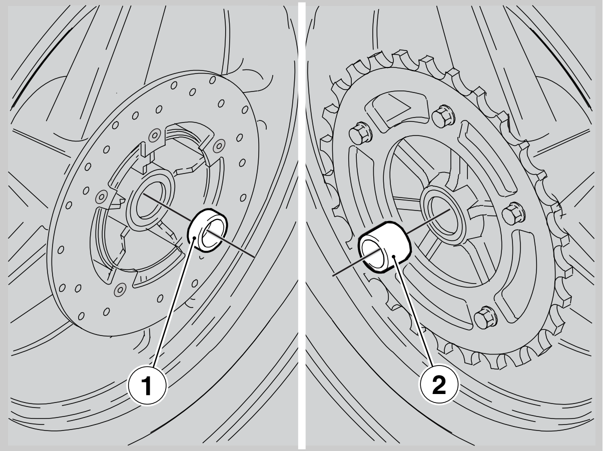
Wheel spindle nut (7): 100 Nm (10.0 kgm).

WARNING
To avoid the risk of burns, allow the engine and silencer to cool down completely before proceeding.
Use great care on refitting, to avoid damage to the brake line, brake disc and brake pads.

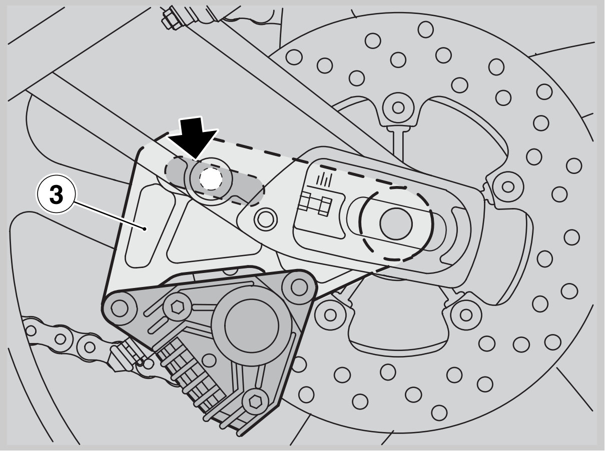
- Grease the outer seating areas of the wheel hub moderately.

NOTE *Ensure that the left-hand (1) and right-hand (2) spacers do not get mixed up. Refit each spacer in its original position.*

- Fit the left-hand (1) and right-hand (2) spacers, each in its location on the wheel hub.



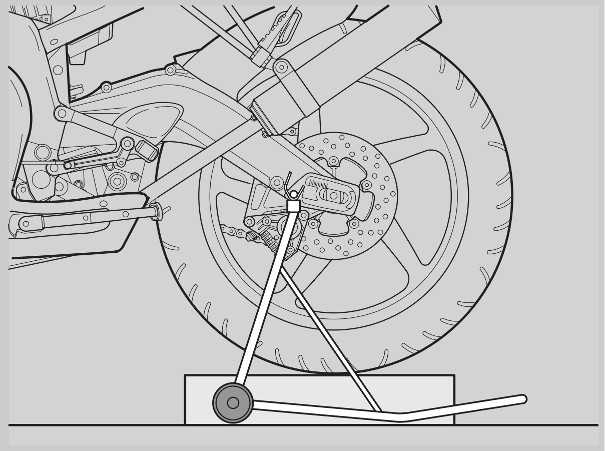
WARNING
Before proceeding to reassemble, check that the caliper carrier (3) is positioned correctly. The carrier slot must be sitting on the locating peg found on the inboard face of the left swinging arm.
Be careful when locating the brake disc to the caliper.



- Place the wheel between the swinging arms above the support.

DANGER
Do not put your fingers between chain and chain sprocket.

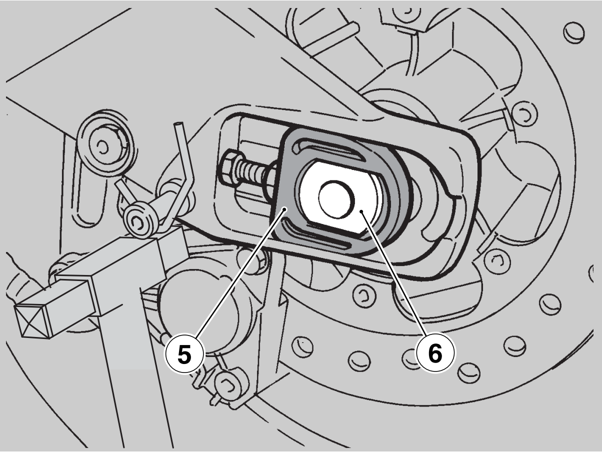
- Push the wheel forward and wrap the chain around the rear chain sprocket.
- Pull the wheel backwards until the centre hole matches the swinging arm holes.



NOTE *Ensure that the right-hand (4) and left -hand (5) tensioners do not get mixed up. Refit each tensioner in its original position.*

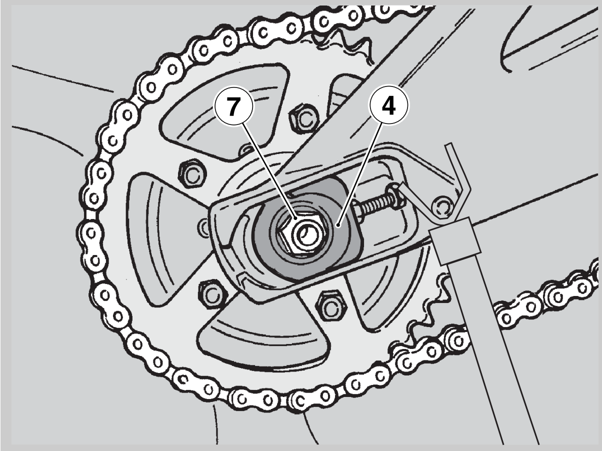
- Locate the right-hand chain tensioner (4) and the left-hand chain tensioner (5) to the swinging arm at the correct positions.
- Smear a light coat of grease evenly on the wheel spindle (6).
- Push the wheel spindle (6) fully home from the left side.

NOTE *Make sure the wheel spindle (6) is fully in with the head fully seated into the left-hand chain tensioner (5).*



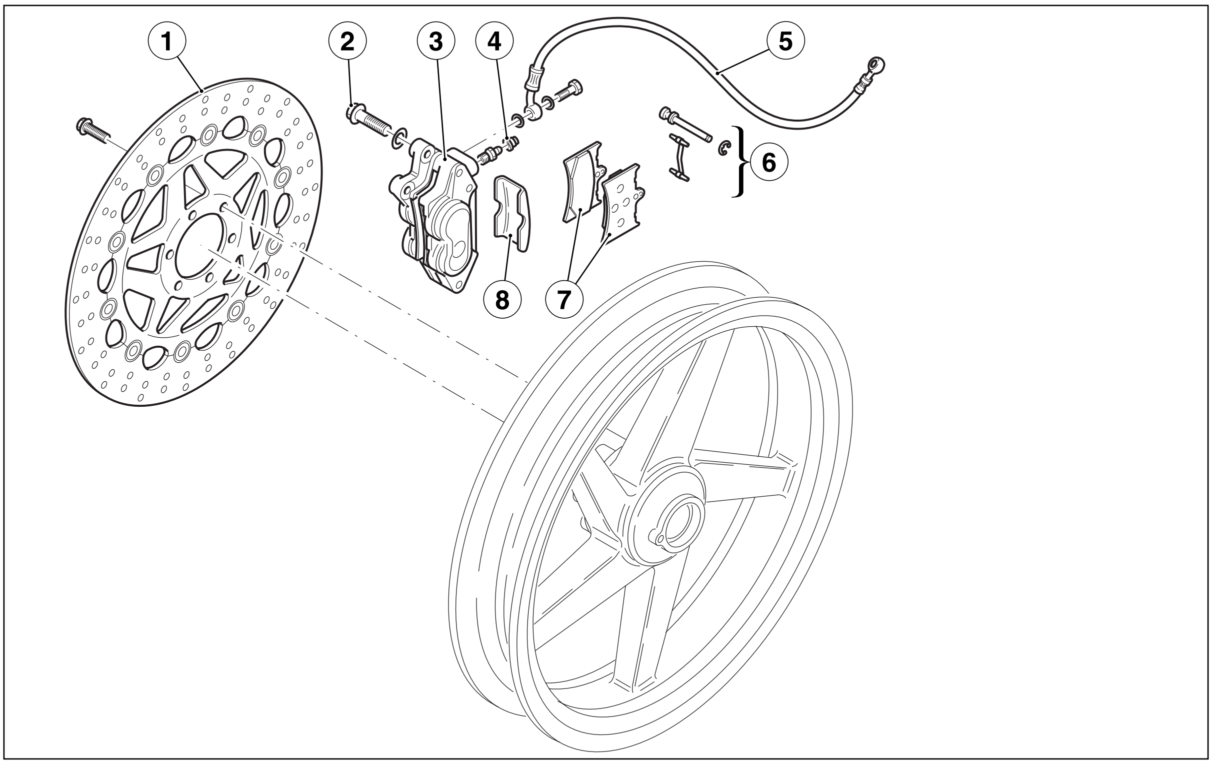
- Fit the washer and screw the nut (7) hand tight.
- Check chain slack; see 2.21.1.
- Tighten the nut (7).

WARNING
After reassembling, operate the rear brake lever repeatedly and check for proper operation of the brake.
Ensure that the wheel is perfectly centred.



7.7. FRONT BRAKE

7.7.1. FRONT BRAKE DIAGRAM



Key:
19. Brake disc
20. Brake caliper mounting bolt
21. Brake caliper
22. Bleed nipple
23. Brake fluid hose
24. Brake pad retainer
25. Brake pads
26. Brake pad cover

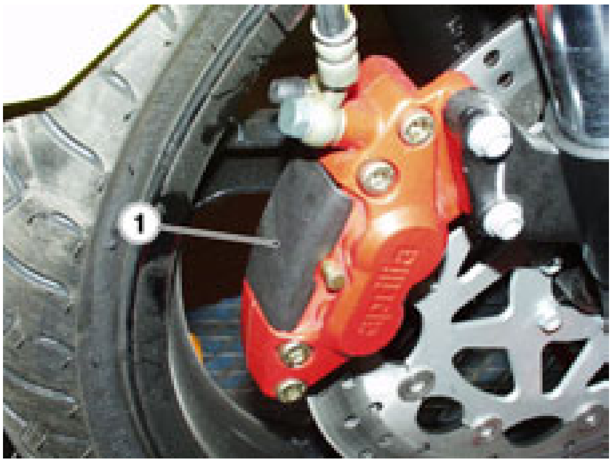
For detailed information:
- see 1.3.1;
- see 2.12.1;
- see 2.12.5;
- see 2.12.3.

WARNING
After each removal, change the brake caliper mounting bolts. Use two bolts of the same type fitted originally.

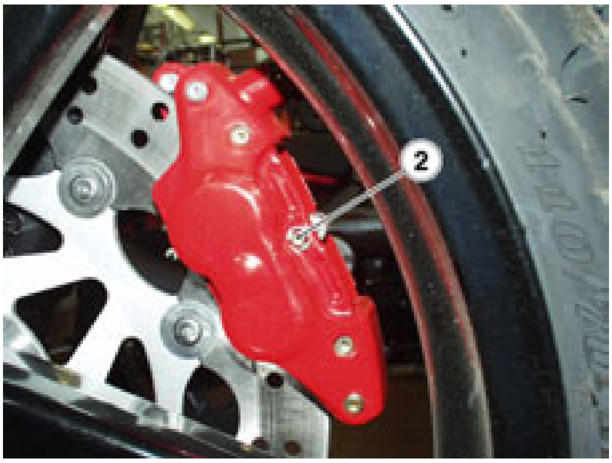
7.7.2. REPLACING THE FRONT BRAKE PADS

Read 1.2.1 and 2.12.3 carefully.

- Place the motorcycle on the side stand.
- Remove the brake caliper cover (1).



- Release the retaining ring (2).

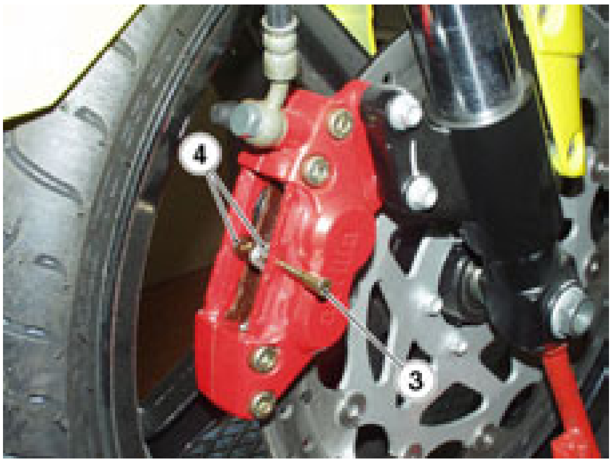


- Withdraw the pin (3) and collect the clip.
- Remove the brake pads (4).

⚠ **WARNING**
Do not operate the brake lever with the brake pads removed, or the brake caliper pistons might fall out leading to loss of brake fluid.

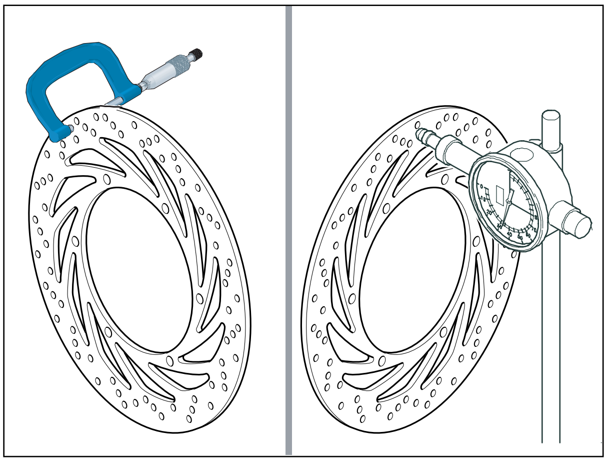
- Fit two new brake pads taking care to align the holes with the caliper holes.

⚠ **WARNING**
The brake pads must always be replaced in pairs. Ensure they become properly seated in the brake caliper.



- Position the clip and insert the pin (3).
- Fit the retaining ring (2).
- Refit the caliper cover (1)
- Check brake fluid level; see 2.12.1.

7.7.3. FRONT BRAKE DISC INSPECTION



***NOTE** The operations described below are to be performed with the brake disc installed to the wheel.*

- Check for wear measuring disc thickness with a micrometer gauge at different positions along the disc. When a disc is worn beyond the service limit even at just one position, the disc must be replaced.

Disc thickness limit: 4.5 mm.

- Check for disc run-out using a dial gauge. Replace disc when the maximum run-out measured exceeds the disc run-out limit; see ☞ 7.7.4.

Disc run-out limit: 0.3 mm.

7.7.4. FRONT BRAKE DISC REMOVAL

Read ☞ 1.2.1 carefully.

TORQUE WRENCH SETTING

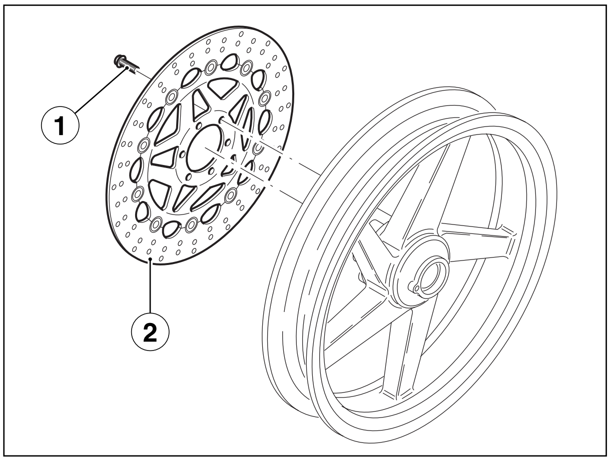
Screws (1)	22 Nm (2.2 kgm).

- Remove the front wheel; see ☞ 7.5.2.

NOTE *The screws (1) are retained with LOCTITE® 243. Use of an air gun is recommended to release the screws.*

- Release and remove the six brake disc screws (1).

WARNING
Apply LOCTITE® 243 to the threads of the brake disc screws (1) on assembly.

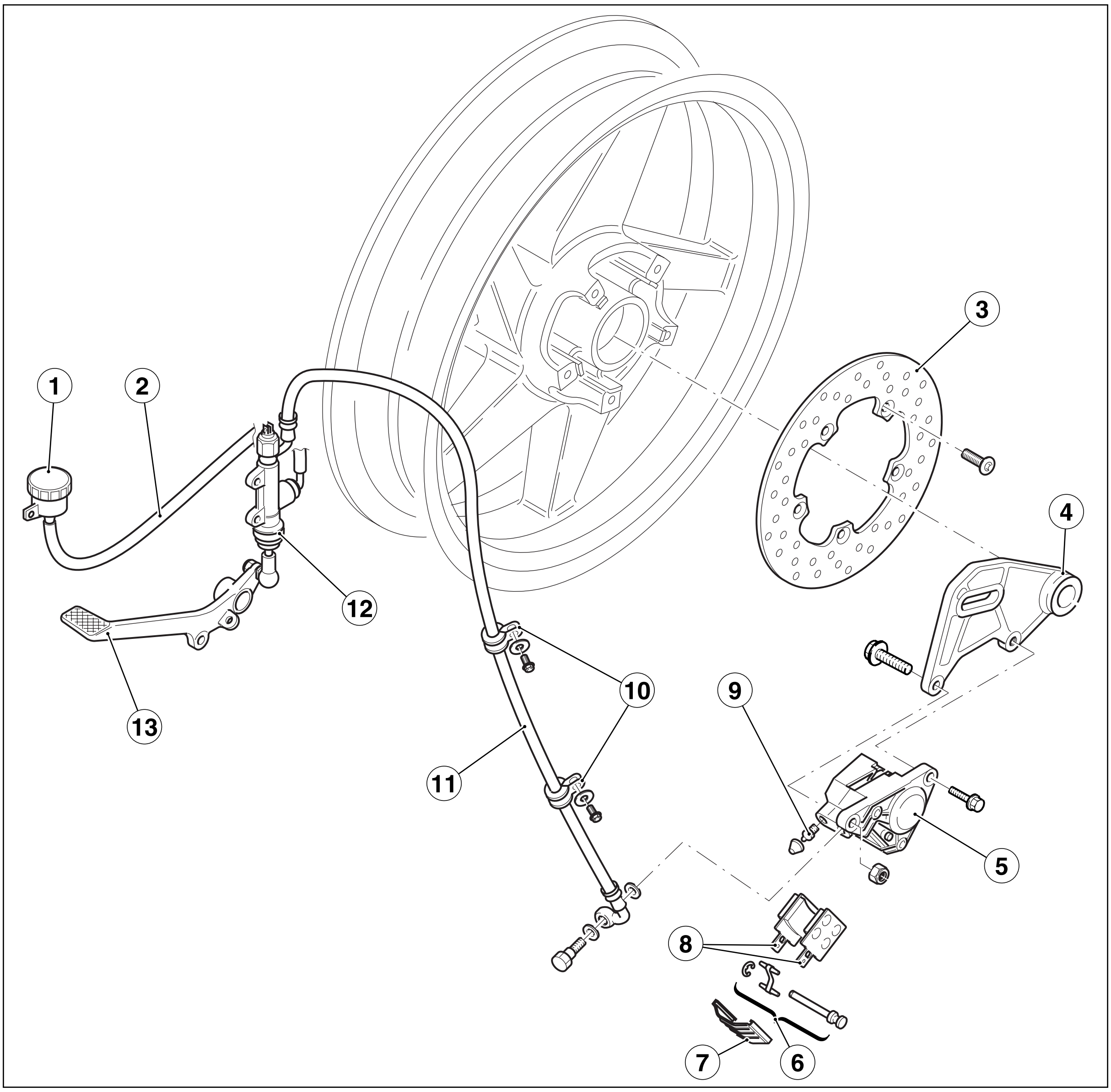


NOTE *To refit, start all screws (1) manually in their holes and tighten in a cross pattern.*

- Remove the brake disc (2).

7.8. REAR BRAKE

7.8.1. REAR BRAKE DIAGRAM



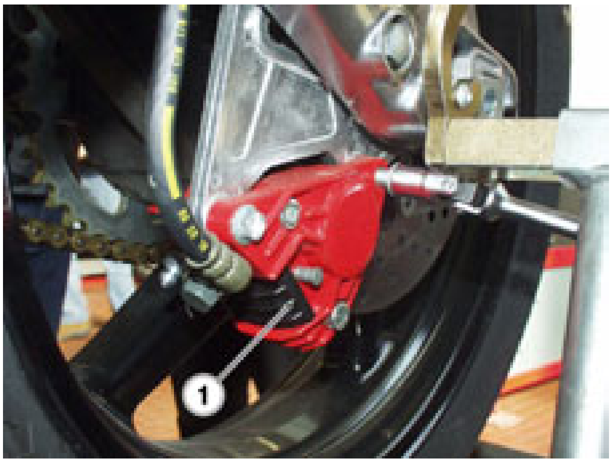
Key:
27. Brake fluid reservoir
28. Rubber hose - reservoir to pump
29. Brake disc
30. Brake caliper carrier
31. Brake caliper
32. Caliper pin and clip
33. Brake caliper cover
34. Pair of brake pads
35. Bleed nipple
36. Clips
37. Rear brake hose
38. Rear brake master cylinder
39. Rear brake lever

For detailed information:
- see ☞ 1.3.1;
- see ☞ 2.12.4;
- see ☞ 2.12.5;
- see ☞ 2.13.1;
- see ☞ 2.12.3.

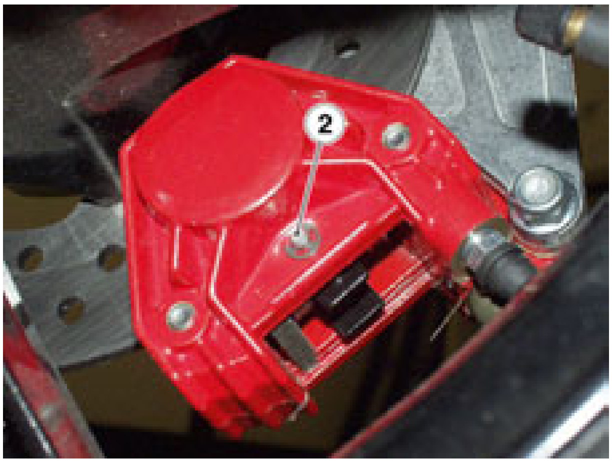
WARNING
After each removal, change the brake caliper mounting bolts. Use two bolts of the same type fitted originally.

7.8.2. REPLACING THE REAR BRAKE PADS

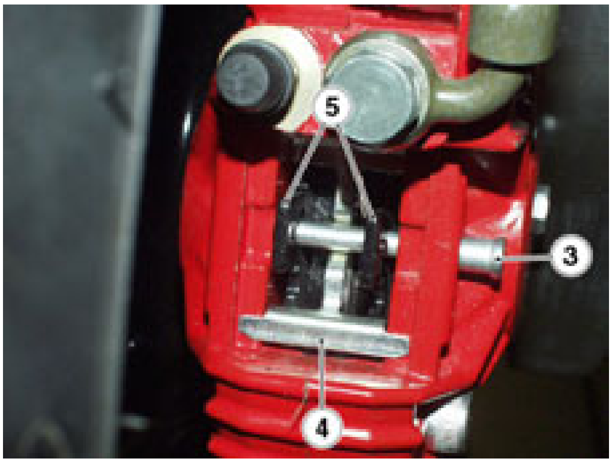
Read 1.2.1 and 2.12.3 carefully.



- Place the motorcycle on the stand.
- Remove the brake caliper cover (1).



- Release the retaining ring (2).



- Withdraw the pin (3) and collect the clip (4).
- Remove the brake pads (5).

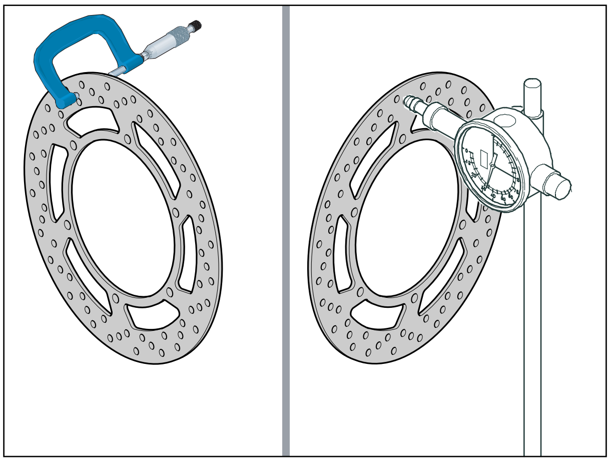
WARNING
Do not operate the brake lever with the brake pads removed, or the brake caliper pistons might fall out leading to loss of brake fluid.

- Fit two new brake pads taking care to align the holes with the caliper holes.

WARNING
The brake pads must always be replaced in pairs. Ensure they become properly seated in the brake caliper.

- Position the clip (4) and insert the pin (3).
- Fit the retaining ring (2).
- Refit the caliper cover (1)
- Check brake fluid level; see 2.12.4.

7.8.3. REAR BRAKE DISC INSPECTION



***NOTE** The operations described below are to be performed with the brake disc installed to the wheel.*

- Check for wear measuring disc thickness with a micrometer gauge at different positions along the disc. When a disc is worn beyond the service limit even at just one position, the disc must be replaced.

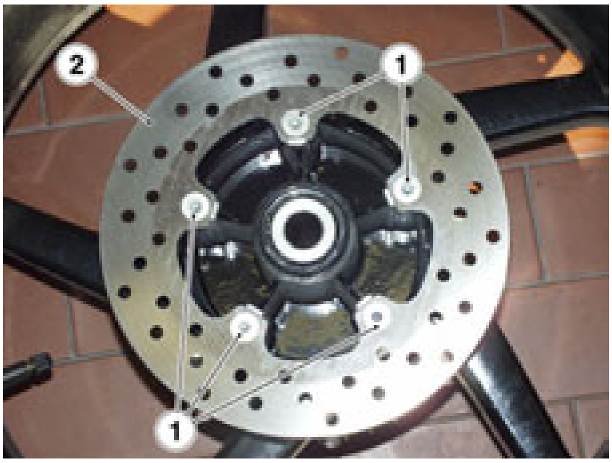
***NOTE** When a disc is worn beyond the service limit even at just one position, the disc must be replaced; see* ☞ 7.8.4.

Disc thickness limit: 4.5 mm.

- Check for disc run-out using a dial gauge. Replace disc when the maximum run-out measured exceeds the disc run-out limit; see ☞ 7.8.4.

Disc run-out limit: 0.3 mm.

7.8.4. REAR BRAKE DISC REMOVAL



Read 1.2.1 carefully.

TORQUE WRENCH SETTING

Screws (1)	10 Nm (1.0 kgm).

- Remove the rear wheel; see 7.6.2.

NOTE *The screws (1) are retained with LOCTITE® 243. Use of an air gun is recommended to release the screws.*

- Release and remove the five brake disc screws (1).

WARNING
Apply LOCTITE® 243 to the threads of the brake disc screws (1) on assembly.

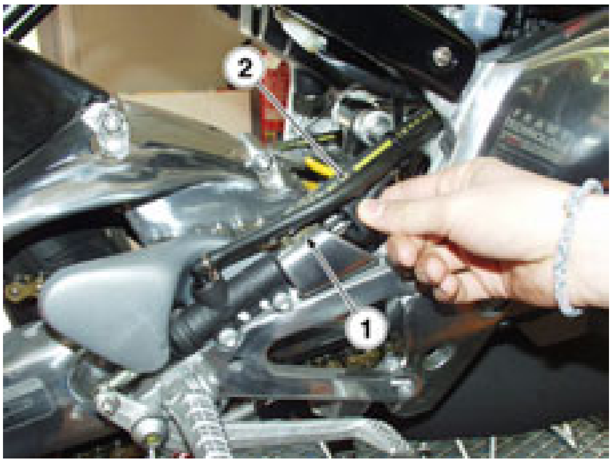
NOTE *To refit, start all screws (1) manually in their holes and tighten in a cross pattern.*

- Remove the brake disc (2).

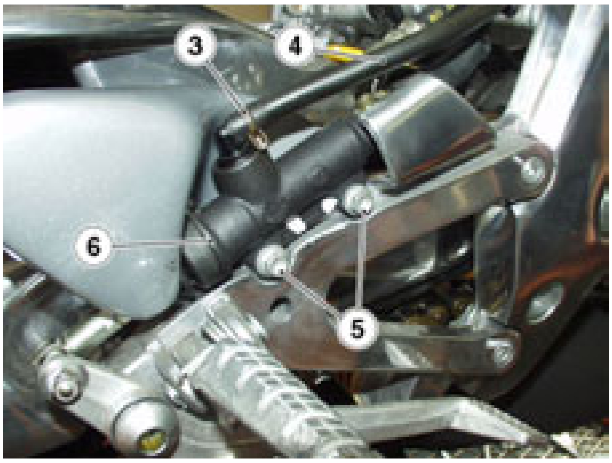
7.8.5. REMOVING THE BRAKE MASTER CYLINDER

TORQUE WRENCH SETTINGS

Screws (5) 10 Nm (1.0 kgm).



- Disconnect the brake light switch connector (1).
- Drain the rear brake circuit; see 2.12.2.
- When all fluid has drained out, unscrew and remove the connector (1).
- Detach the hose (2) to the rear brake master cylinder and collect the two sealing washers.



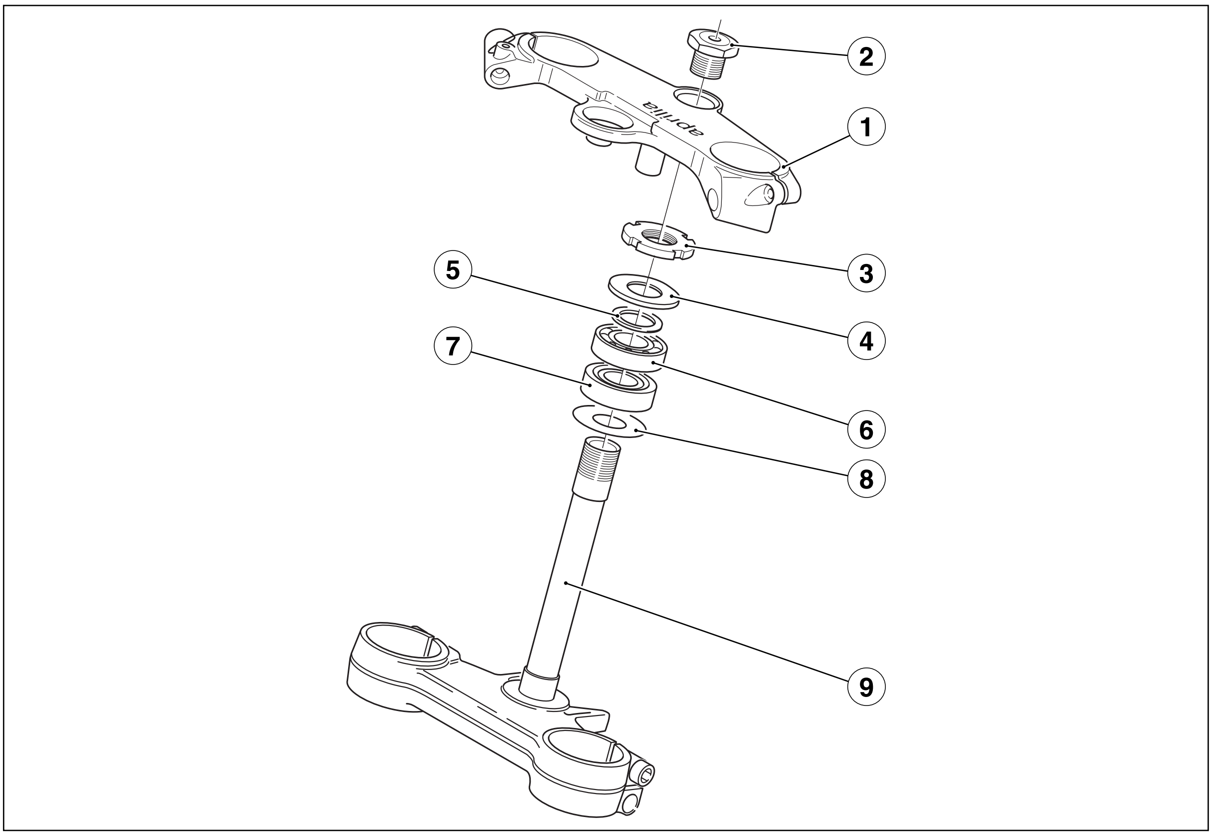
- Slacken the hose clip (3) and slide it aside.
- Detach the hose (4) from the master cylinder fitting.
- Release and remove the two screws (5).
- Remove the cylinder (6) sliding it forward.

WARNING
Avoid disturbing the pedal joint unless strictly necessary. When the joint has been removed, apply LOCTITE® 270 to the thread before refitting and tighten firmly.

NOTE *After refitting, top up brake fluid level - see* 2.12.4 *and bleed the brake - see* 2.12.5.

7.9. STEERING

7.9.1. STEERING DIAGRAM



Key:

40. Top yoke
41. Steering tube cap
42. Bottom lockring
43. Seal
44. Headstock washer
45. Ball bearing
46. Roller bearing
47. Bottom dust seal
48. Bottom yoke and steering stem

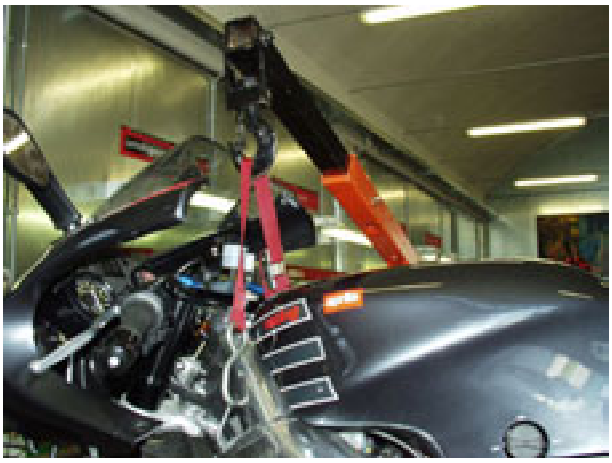
Always grease the bottom yoke and steering stem on refitting; see ☞ 1.8.1.

7.9.2. HEADSTOCK REMOVAL

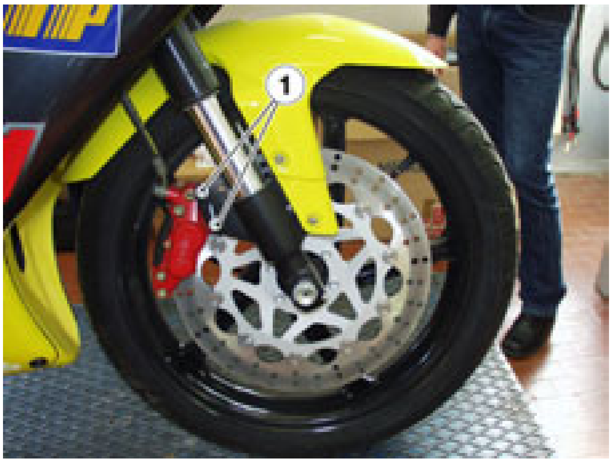
Read ☞ 1.2.1 carefully.

TORQUE WRENCH SETTINGS

Brake caliper mounting bolts (1)	22 Nm (2.2 kgm)

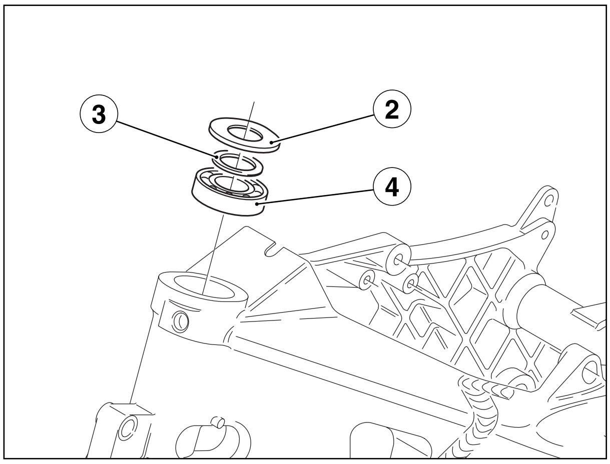


- Place the motorcycle on the rear wheel stand (OPT); see ☞ 1.7.2.
- Remove the air scoop; see ☞ 7.1.17.
- Connect the slings to the holes on the outside of the frame.
- Lift the hoist arm until stretching the slings taut.
- Remove the mudguard; see ☞ 7.1.10.

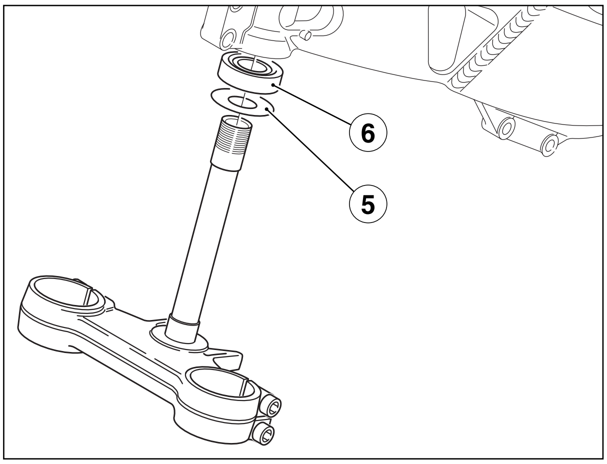


- Release and remove the two mounting bolts (1) of the front brake caliper.
- Remove the caliper from the disc but leave it attached to the hose.

WARNING
Do not operate the front brake lever with the brake caliper removed, or the brake caliper pistons might fall out leading to loss of brake fluid. The front end is heavy. An assistant will be required to support it. When working with an assistant, plan the whole procedure carefully together.



- While the assistant holds the front end steady, unscrew and remove the adjusting ring nut and perform the first five operations described at paragraph ☞ 2.16.1.
- Raise the hoist arm until lifting the front end clear of the steering tube.
- Collect the following parts in the order:
  - Oil seal (2);
  - Washer (3);
- Remove the ball bearing (4) using a suitable extractor;



- Bottom dust seal (5);
- Remove the roller bearing (6) using a suitable extractor.

7.9.3. COMPONENT INSPECTION

WARNING
Check that all components are in perfect condition. Pay special attention to the components listed below.

BEARINGS
Rotate the inner ring manually. The ring should turn smoothly, with no hardness or noise.
There should be no end float.
Replace any bearings that do not meet the above requirements.

SEALS
Inspect the seals and replace if damaged or badly worn.

7.9.4. HEADSTOCK RE-ASSEMBLY

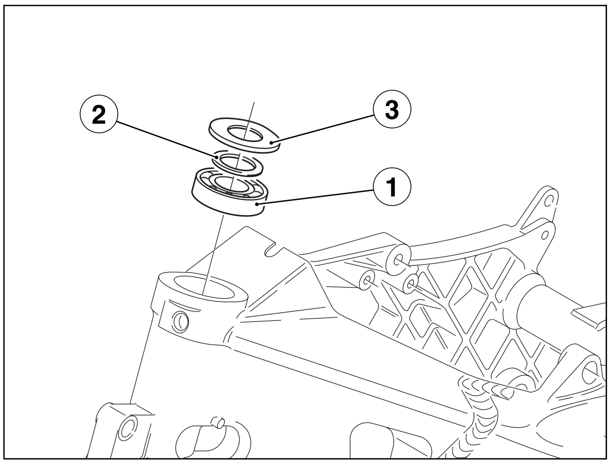
Read 1.2.1 carefully.

TORQUE WRENCH SETTINGS

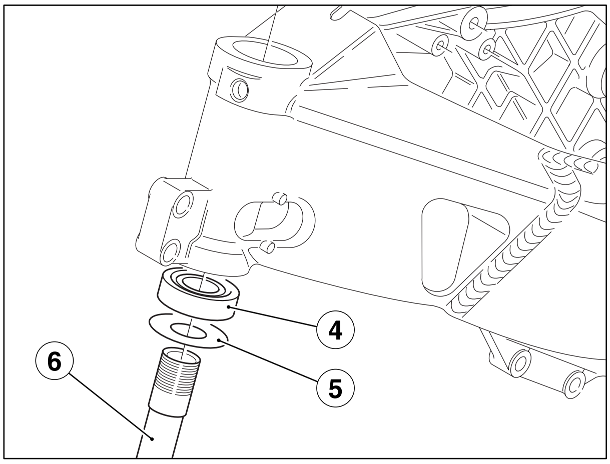
Brake caliper mounting bolts	22 Nm (2.2 kgm)

NOTE *Make sure to have a drift with the same diameter as the bearing outer ring available.*

- Fit the bearing (1) to the top end of the steering tube using the drift.
- Position the washer (2) and the oil seal (3) in the order.



- Fit the bearing (4) to the bottom end of the steering tube using the drift.
- Position the bottom dust seal (5).
- Grease the steering stem and install the bottom yoke and steering stem (6); see 1.8.1.
- Before finally tightening the adjusting ring, turn the steering in both directions repeatedly. This will allow the bearings to seat themselves properly.
- Adjust play in the bearings; see 2.16.1.
- Turn the handlebars to ensure that cables and hoses do not bind. Ensure that cables and hoses are not twisted or twisted around one another.
- Lower the hoist arm.

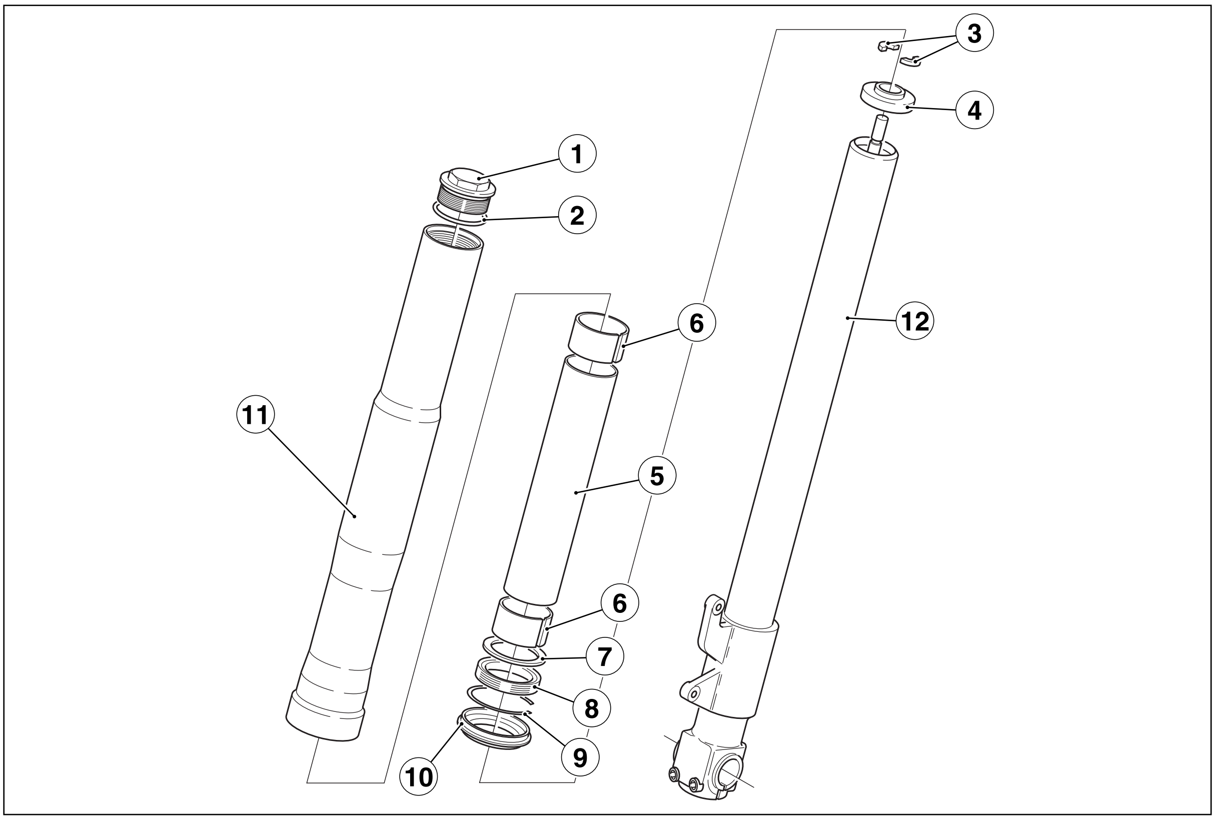


WARNING
Ensure that the rear wheel stand (OPT) is positioned correctly before removing the slings.

- Install the brake caliper to the brake disc.
- Install the mudguard; see 7.1.10
- Detach the slings from the frame.
- Install the air scoop; see 7.1.17
- Install the front fairing.

7.10. FRONT FORK

7.10.1. FRONT FORK DIAGRAM



Key:

49. Top cap
50. O-ring
51. Half ring
52. Spring cup
53. Spacer
54. Slide bush
55. Guide bush cup
56. Oil seal
57. Retaining ring
58. Dust seal with clip
59. Slider
60. Stanchion tube

7.10.2. REMOVING THE STANCHION TUBES – SLIDERS

Read 1.2.1 carefully.

TORQUE WRENCH SETTINGS

Top yoke bolt (1)	25 Nm (2.5 kgm)
Bottom yoke bolts (2)	25 Nm (2.5 kgm)

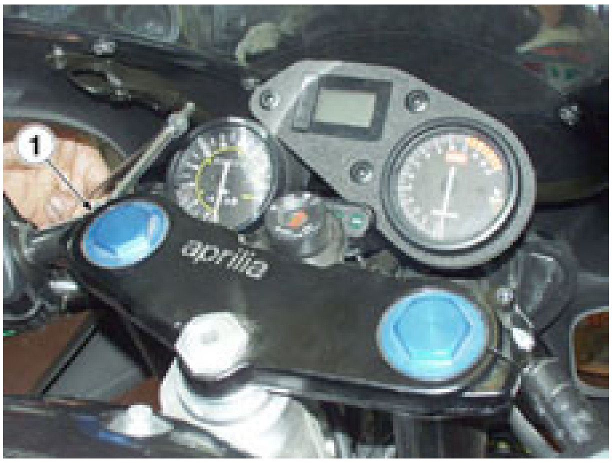
NOTE *The operations described below apply to both fork legs.*

WARNING
Service the fork legs one at a time. Always refit a fork leg in the correct position before removing the other.

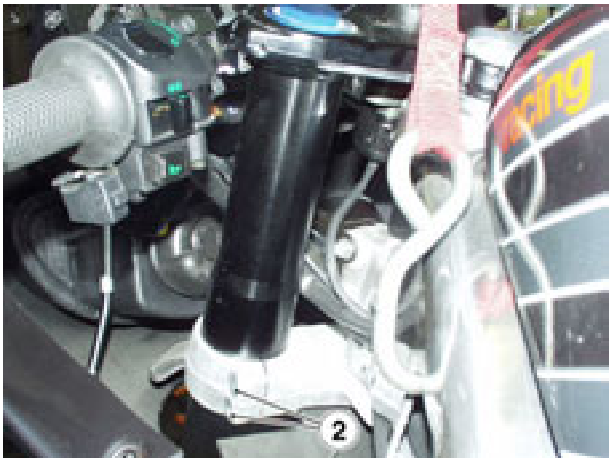
- Perform the first seven steps of the procedure described at paragraph 7.9.2.
- Remove the front wheel; see 7.5.2.
- Place the slider in a vice with soft jaws.

WARNING
The stanchion-and-slider assembly contains oil. Do not turn it over or tilt it during removal.

- Slacken the bolt (1).



- Slacken the two bolts (2).



- Slide stanchion and slider off the top and bottom yokes.

7.10.3. DISASSEMBLING THE STANCHION TUBES – SLIDERS

Read 1.2.1 carefully.

NOTE *The operations described below apply to both fork legs.*

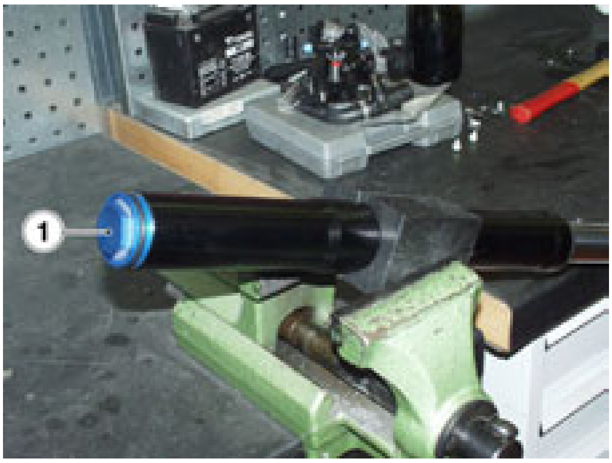
- Remove the stanchion tubes-sliders; see 7.10.2
- Clean the stanchion tubes-sliders thoroughly.

NOTE *Make sure to have a container having a capacity greater than 430 cu. cm. ready at hand before proceeding.*

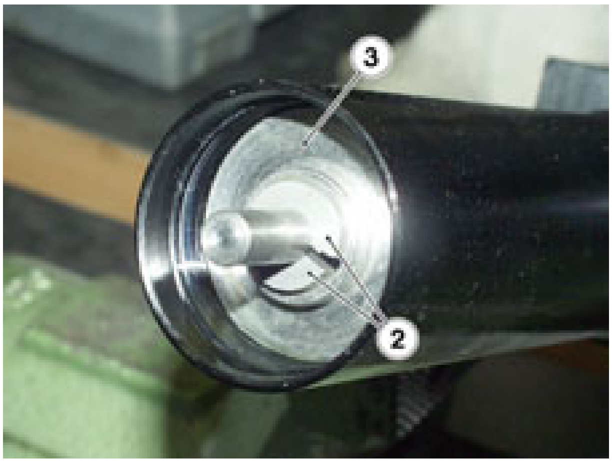
- Place the slider in a vice with soft jaws.

WARNING
The stanchion-and-slider assembly contains oil. Do not turn it over or tilt it during removal.

- Undo the top cap (1) carefully. Be sure not to damage the O-ring when removing the cap.



- Push the stanchion into the slider to give access to the two half-rings (2). Extract the half-rings.
- Extract the spring washer (3).

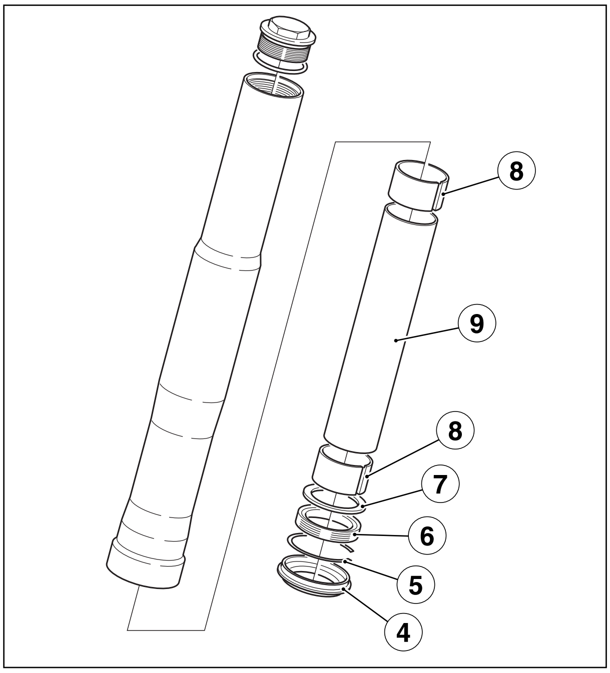


- Drain the oil into the container.

- Grasp the slider and pull firmly to separate slider and stanchion.

NOTE *Take care not to damage the slider inner seating surface during removal of the different components.*

- Lever with a flat-blade screwdriver to remove the dust seal (4).
- Use a small screwdriver to remove the retaining ring (5) from inside the slider.
- Extract the oil seal (6) with the aid of a large screwdriver.
- Slide out the guide bush cap (7) from inside the slider.
- Tap the end of the slider firmly on a wooden bench to knock out the slide bushes (8) and the spacer (9).



WARNING
Keep the slider at right angles to the bench while tapping.
If the bushes are a tight fit in the slider, use a bush extractor, but be careful not to scratch the slider inner surface.

7.10.4. CHANGING FRONT FORK OIL

Read ☞ 1.2.1 carefully.

Oil quantity: 430±2.5 cu cm; see ☞ 1.7.1.
Oil specifications; see ☞ 1.8.1.

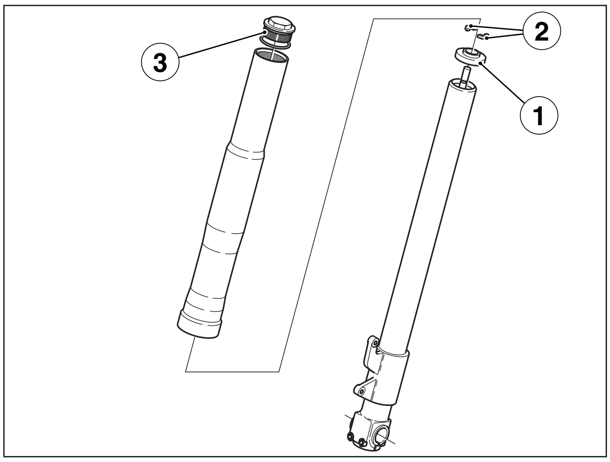
***NOTE** The operations described below apply to both fork legs.*

DRAINING OIL

- Perform the first six steps of the procedure described at paragraph ☞ 7.10.3.

FILLING

- Place the slider upright in a vice with soft jaws.
- Fill fork fluid into the slider.
- Position the spring cup (1).
- Insert the two half-rings (2).
- Check the O-ring is in place and tighten the top cap (3).



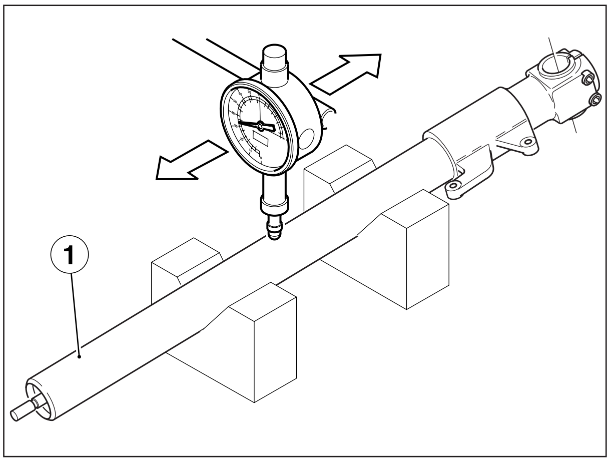
7.10.5. COMPONENT INSPECTION

Read ☞ 1.2.1 carefully.

STANCHION TUBE

- Inspect the sliding surface for scoring and/or scratching. Eliminate minor scoring with wet sand paper (grain size 1).
- Replace the stanchion (1) if badly scored.
- Check for stanchion (1) buckling using a dial gauge.
- Replace the stanchion if buckled beyond the service limit.

Service limit: 0.2 mm.



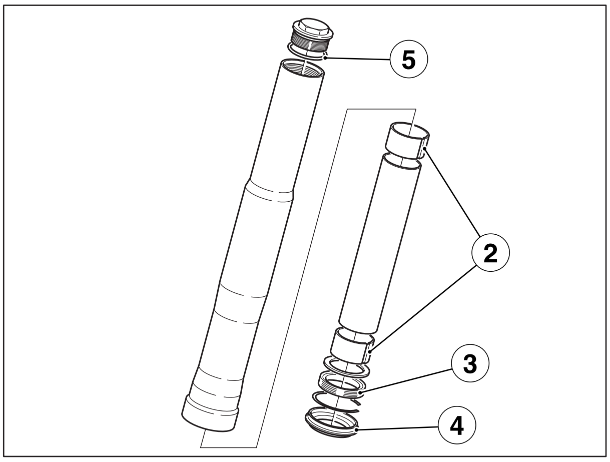
⚠ **DANGER**
Never attempt to straighten a buckled stanchion as this would weaken the overall structure leading to a dangerous riding condition.

SLIDER

- Inspect for damage and/or cracking. Replace if damaged.
- Check the condition of the slide bushes (2).
- Change any component which is badly worn or damaged.

⚠ **WARNING**
Clean off any debris collected by the bushes taking care not to scratch the bush surface.

Renew the following components on assembly:
- oil seal (3);
- dust seal (4);
- top cap O-ring (5).



7.10.6. STANCHION TUBE – SLIDER ASSEMBLY

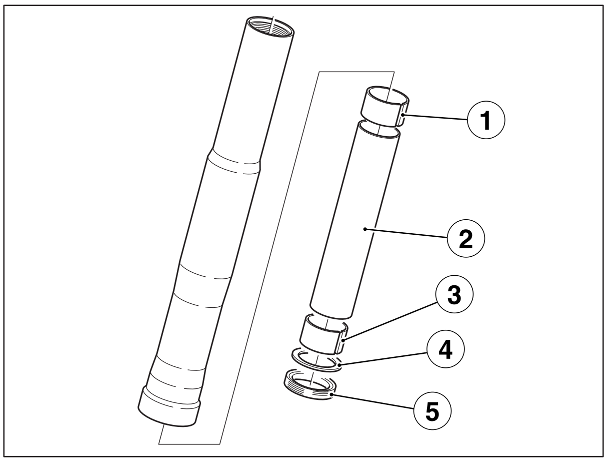
Read 1.2.1 carefully.

- Inspect the components; see 7.10.5.

WARNING
Take care to prevent the ingress of dirt into slider and stanchion.
Never reuse the oil you have drained from the fork.

NOTE *Apply a light film of fork oil to the bushes and seals before assembly.*

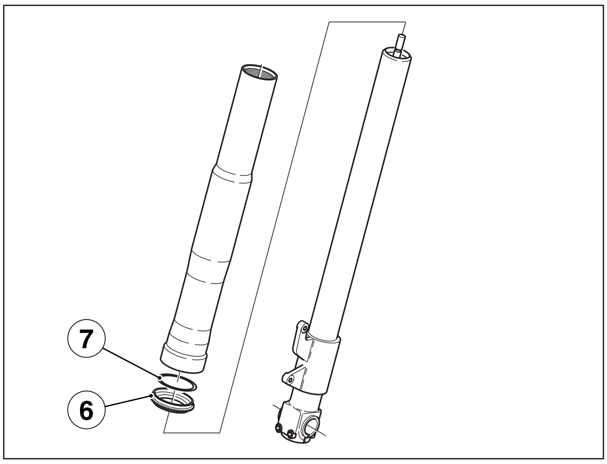
- Insert the slide bush (1) and push into the slider using the spacer (2).
- Insert the other slide bush (3). Push into place in the slider using a drift of adequate size.
- Insert the guide bush cup (4) into the slider and push it into contact with slide bush (3).
- Lubricate the oil seal (5).
- Push the oil seal (5) into contact with the guide bush cap (4). The concave side of the seal must be facing into the slider.



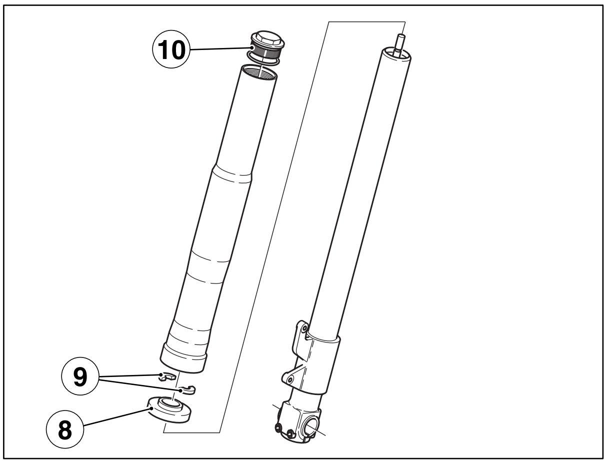
- Fit the following components to the stanchion in the order:
  - dust seal (6);
  - retaining ring (7);
- Place the stanchion in a vice with soft (aluminium) jaws.
- Fit the slider to the stanchion.
- Install the retaining ring (7) and dust seal (6) so that they become seated into the slider.
- Pour fork fluid into the slider.

Oil quantity: 430 ± 2.5 cu cm.

NOTE *Oil level must be the same in both fork legs.*



- Insert the spring cup (8) and the two half-rings (9) into their seats on the damping cylinder rod.
- Lift the slider.
- Make sure the O-ring is in place on the top cap (10).
- Screw the top cap (10) onto the slider and tighten.



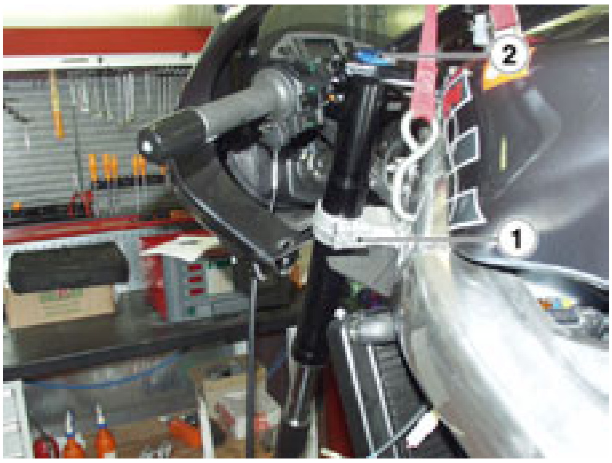
7.10.7. INSTALLING STANCHIONS AND SLIDERS

Read 1.2.1 carefully.

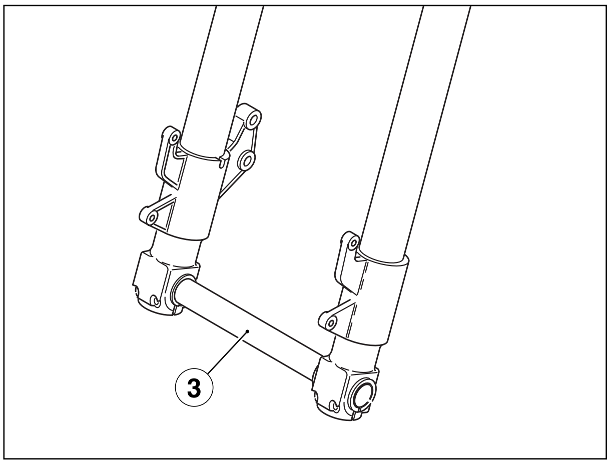
TORQUE WRENCH SETTINGS

Top yoke bolt (5)	25 Nm (2.5 kgm)
Bottom yoke bolts (4)	25 Nm (2.5 kgm)

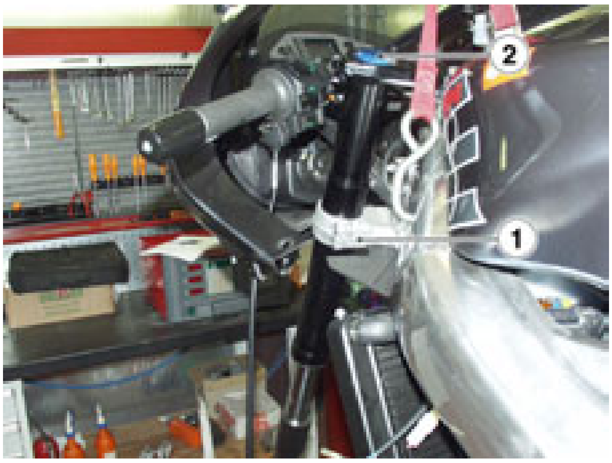
Slide the slider-and-stanchion assembly through the bottom (1) and top yokes (2).



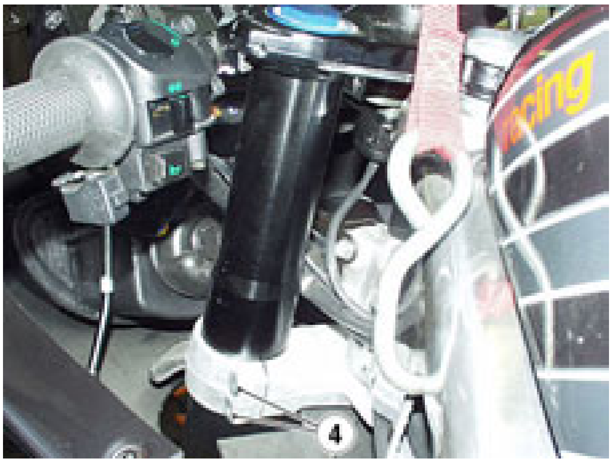
- Insert the wheel spindle (3) into both fork legs to keep the holes aligned.



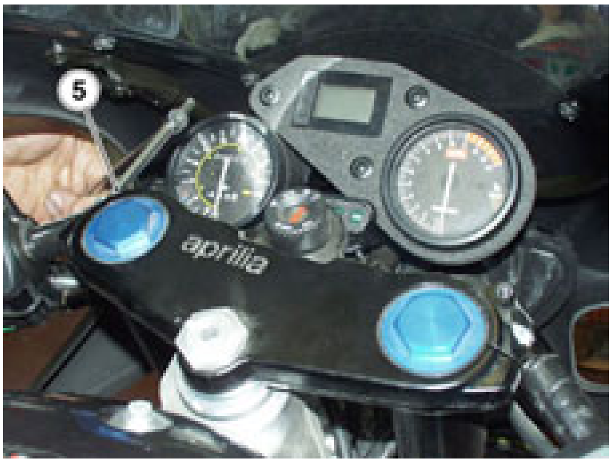
- Check that the slider is correctly seated in the bottom (1) and top yokes (2).



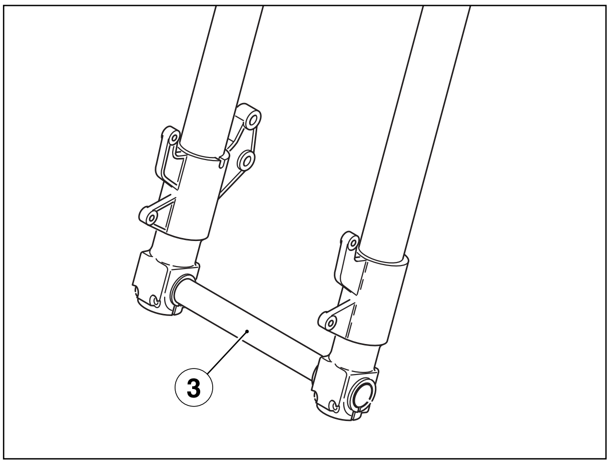
- Tighten the two bolts (4) securing the bottom yoke (1) to the slider.



- Tighten the bolt (5) securing the top yoke (2) to the slider.



- Remove the wheel spindle (3).
- Refit the wheel; see 7.5.2.
- Lower the hoist arm.



WARNING
Make sure the rear wheel stand (OPT) is positioned correctly before detaching the slings.

- Detach the slings from the frame.
- When finished, operate the front brake and press down on the fork repeatedly.
- Fork operation should be smooth and progressive. There must be no traces of oil on the fork legs.

***NOTE** Check front suspension setting before riding the motorcycle.*

- Install the mudguard; see 7.1.10
- Install the air scoop; see 7.1.17.
- Install the front fairing.

7.11. REAR SWINGING ARM

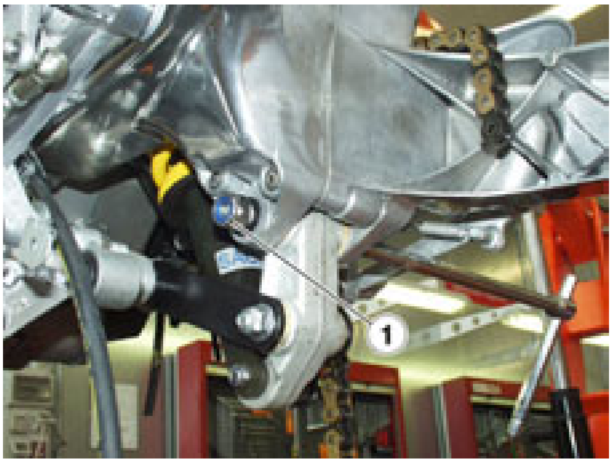
7.11.1. REMOVING THE REAR SWINGING ARM

Read 1.2.1 carefully.

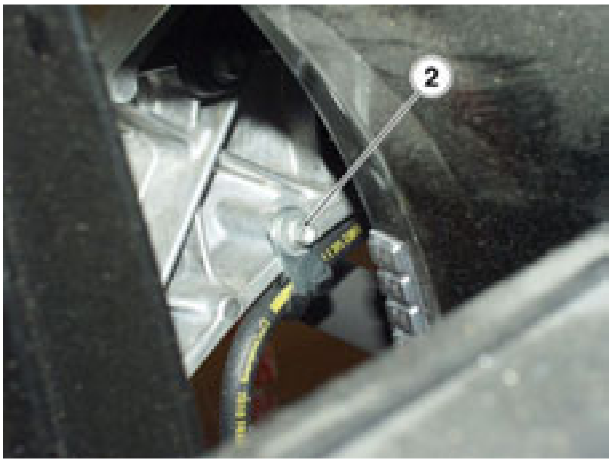
TORQUE WRENCH SETTINGS

Linkages to swinging arm (1)	80 Nm (8.0 kgm)
Brake hose clips (2-3)	3 Nm (0.3 kgm)
Rear screw (4)	22 Nm (2.2 kgm)
Lockring (5)	35 Nm (3.5 kgm)
Adjusting bush (6)	12 Nm (1.2 kgm)
Swinging arm spindle (7)	100 Nm (10.0 kgm).

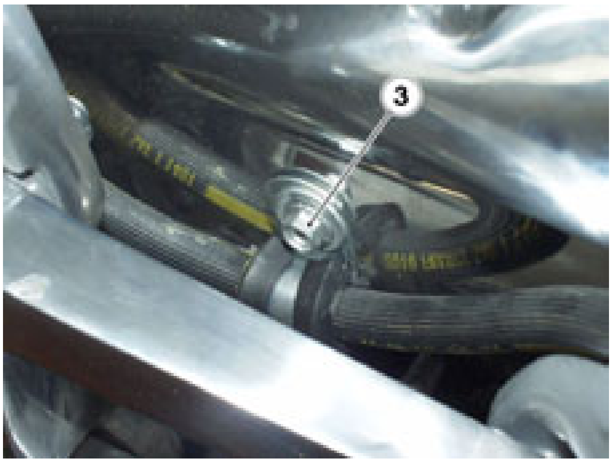
- Place the motorcycle on the front wheel stand (OPT); see 1.7.1.
- Remove the fuel tank; see 2.9.1.
- Fix the slings to the frame at the engine top mounting point.
- Raise the hoist arm until stretching the slings taut.
- Remove the drive chain; see 7.13.1.
- Remove the rear wheel; see 7.6.2.
- Working from the left-hand side, undo and remove the nut (1) and collect the washer.
- Withdraw the screw from the opposite end.
- Remove the linkages from the swinging arm.



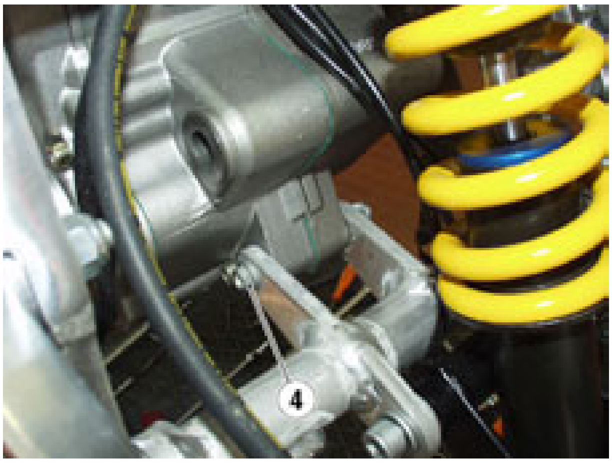
- Release and remove the inner screw (2).
- Slip the hose clip off the swinging arm. The clip is still secured to the rear brake hose.



- Release and remove the outer screw (3).
- Slip the hose clip off the swinging arm. The clip is still secured to the rear brake hose.

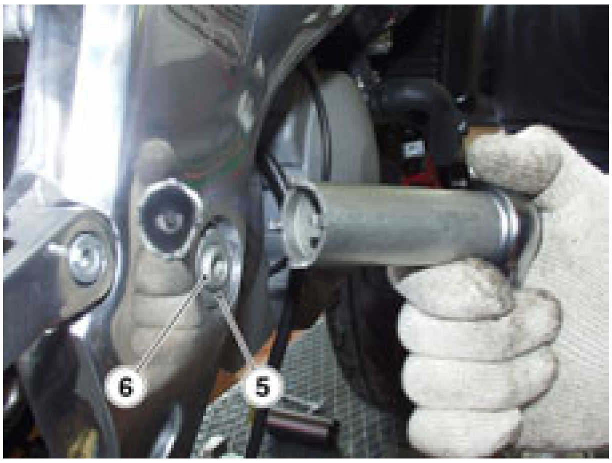


- Slacken the engine-to-frame mounting bolt (4) to facilitate swinging arm removal.

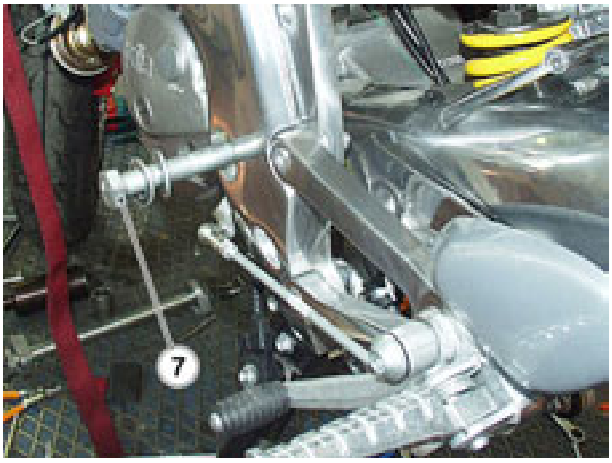


NOTE *Make sure to have the special tool no. 8101945 (socket for swinging arm spindle adjustment) ready at hand.*

- Working from the right-hand side, slacken the lockring (5) fully using the special socket.
- Slacken the adjusting bush (6).



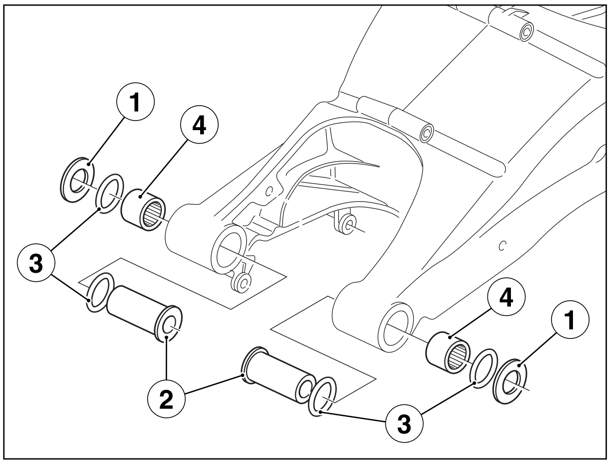
- Working from the left-hand side, release and remove the swinging arm spindle (7) and collect the two washers.
- Remove the swinging arm from the frame.



7.11.2. DISMANTLING THE SWINGING ARM

Read 1.2.1 carefully.

- Remove the swinging arm; see 7.11.2.
- Place the swinging arm on a work bench.
- Clean both sides of the bearing housings with a cloth.
- Remove the outer plastic washers (1).
- Slide both bushes of the needle roller bearings (2) off the swinging arm.
- Extract the four O-rings (3).
- Extract the needle roller bearings (4) using a drift with adequate diameter.

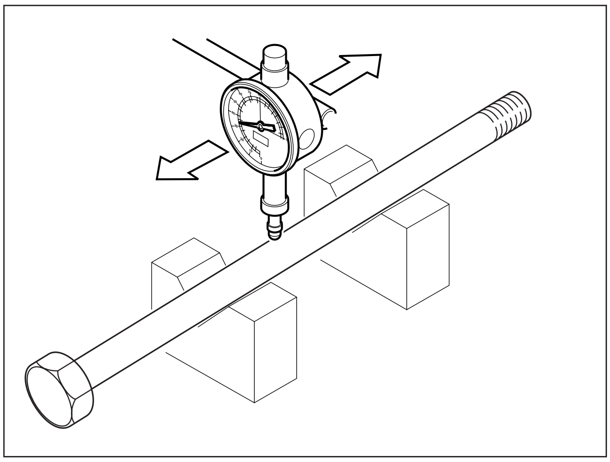


7.11.3. COMPONENT INSPECTION

NOTE *Check all components for distortion, damage, cracking and denting. Replace any damaged components.*

NEEDLE ROLLER BEARINGS
Rotate the roller cages manually. They must rotate smoothly, with no hardness or noise.
There should be no end float.
Replace any needle roller bearings that do not meet these requirements.
Grease the rollers; see ☞ 1.8.1.

SEALS
Check the condition of the seals. Replace any damaged or worn seals.



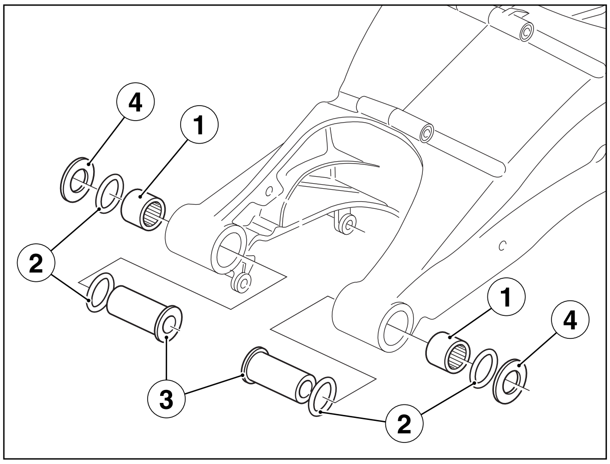
SWINGING ARM SPINDLE
Check spindle run-out using a dial gauge.
Replace spindle when run-out exceeds the allowed limit.
Spindle run-out limit: 0.3 mm.

7.11.4. REASSEMBLING THE SWINGING ARM

Read 1.2.1 carefully.

NOTE *Change both needle roller bearings.*

- Clean all components of the swinging arm articulated connection and apply lithium grease.
- Install two new needle roller bearings (1) using a drift with adequate diameter. The bearings must be centred axially in the bearing housing.
- Position the four O-rings (2).
- Slide the two bushes of the needle roller bearings (3) into the swinging arm.
- Position the outer plastic washers (4).



7.11.5. INSTALLING THE SWINGING ARM

Read 1.2.1 carefully.

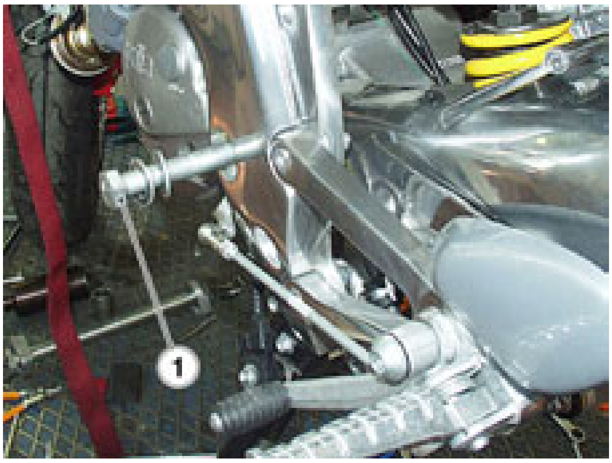
TORQUE WRENCH SETTINGS

Swinging arm spindle (1)	100 Nm (10.0 kgm).
Adjusting bush (2)	12 Nm (1.2 kgm)
Lockring (3)	35 Nm (3.5 kgm)
Rear screw (4)	22 Nm (2.2 kgm)
Linkages to swinging arm (5)	80 Nm (8.0 kgm)
Brake hose clips (6-7)	3 Nm (0.3 kgm)

- Fit the two washers to the spindle (1).
- Smear the thread of the swinging arm spindle (1) with oil.

WARNING
The tail section is heavy. An assistant will be required to perform the following operations. When working with an assistant, plan the whole procedure carefully together.

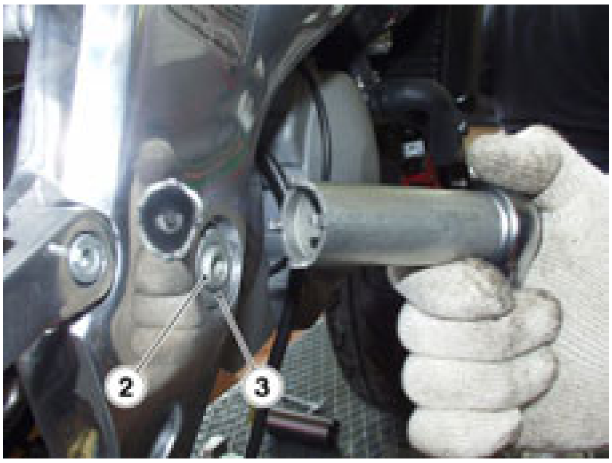
- Locate the swinging arm to the frame.
- Position the swinging arm so as to match the holes. At the same time, push the spindle (1) fully home from the left-hand side.



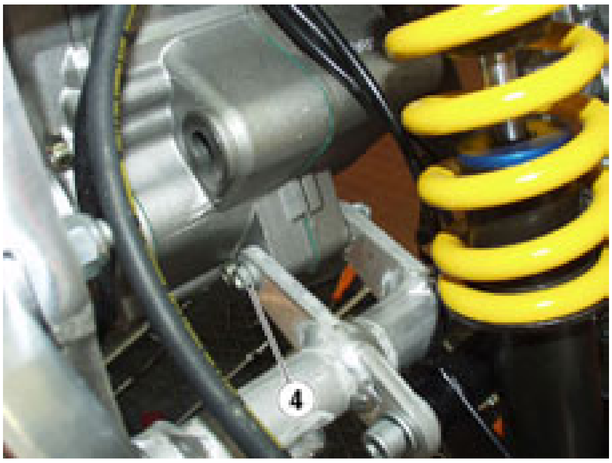
- Correct adjustment of swinging arm spindle play is obtained by screwing the adjusting bush (2) all the way in and tightening an additional 1/4 turn.

***NOTE** Make sure to have the special tool no. 8101945 (socket for swinging arm spindle adjustment) ready at hand.*

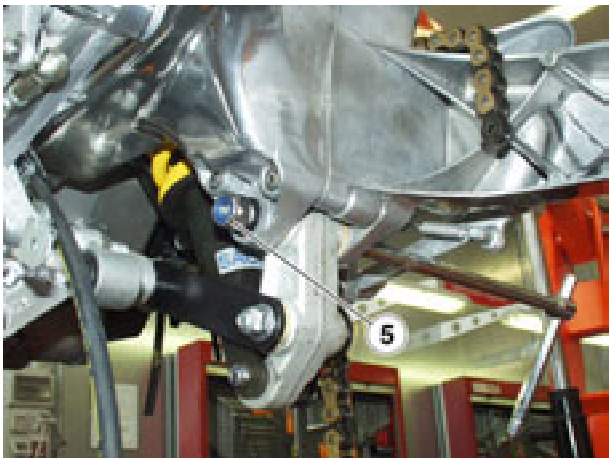
- Lock out bush (2) rotation and tighten the lockring (3) using the special tool.
- Adjust the rear swinging arm; see 2.17.3.



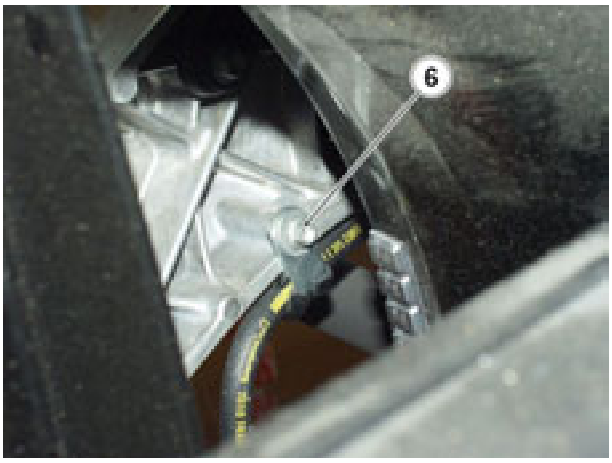
- Tighten the engine-to-frame mounting bolt (4).



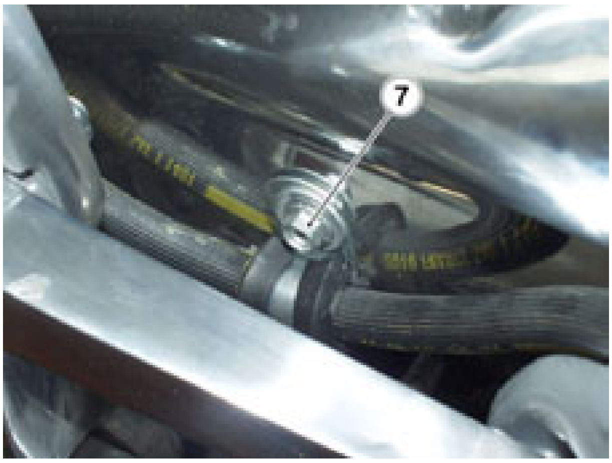
- Position the linkages to the swinging arm.
- Insert the screw from the right-hand side.
- Position the washer and tighten the nut (5).



- Route the brake hose along the swinging arm.
- Secure the brake hose inner clip with the screw (6).



- Secure the brake hose outer clip with the screw (7).
- Install the rear wheel; see ☞ 7.6.6
- Install the drive chain; see ☞ 7.13.2.
- Lower the hoist arm.
- Disconnect the slings from the frame.
- Install the fuel tank; see ☞ 4.1.1



7.12. REAR SUSPENSION

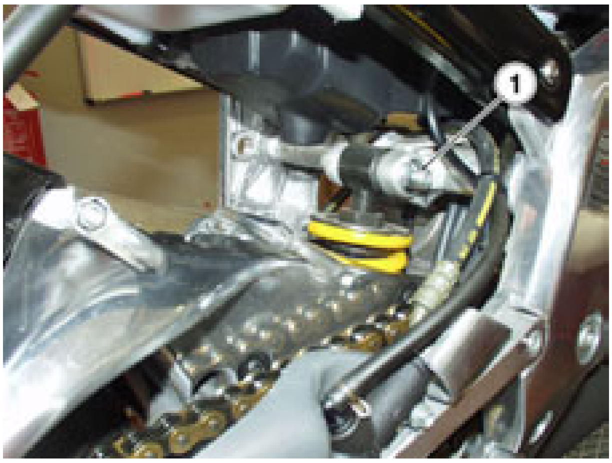
7.12.1. REAR SHOCK ABSORBER REMOVAL

Read 1.2.1 carefully.

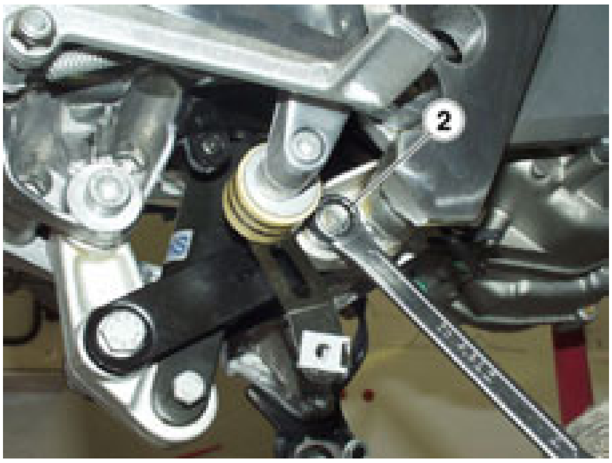
TORQUE WRENCH SETTINGS

Shock absorber to frame (1)	50 Nm (5.0 kgm)
Linkages to frame (2)	50 Nm (5.0 kgm)
Shock absorber to linkages (3)	25 Nm (2.5 kgm)

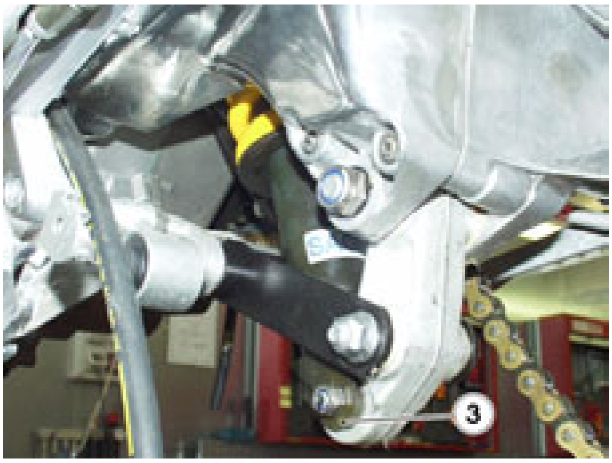
- Place the motorcycle on the front wheel stand (OPT); see 1.7.1.
- Place the motorcycle on the rear wheel stand (OPT); see 1.7.2.
- Place a support between swinging arm and seat subframe to keep the shock absorber uncompressed.
- Working the from the right-hand side, undo and remove the top nut (1).
- Withdraw the bolt from the opposite side and collect the washer.



- Working from the right-hand side, undo and remove the nut (2).
- Withdraw the bolt from the opposite side and collect the washer.



- Working from the left-hand side, undo and remove the nut (3).
- Withdraw the bolt from the opposite side.



- Pull the shock absorber in a downward motion to remove.

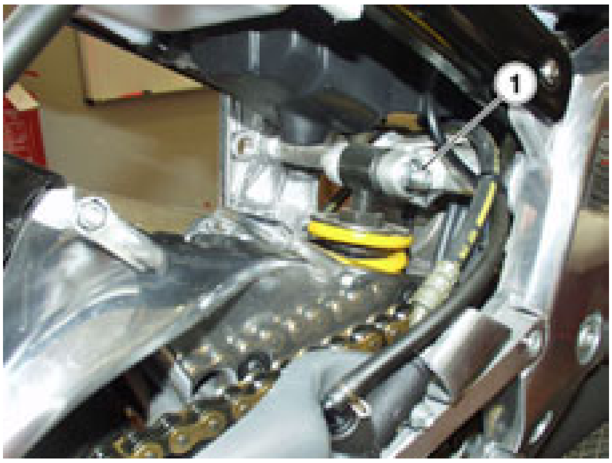
7.12.2. REAR SHOCK ABSORBER INSTALLATION

Read 1.2.1 carefully.

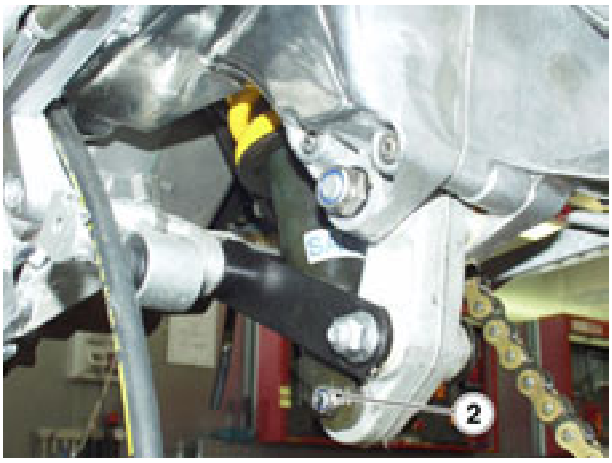
TORQUE WRENCH SETTINGS

Shock absorber to frame (1)	50 Nm (5.0 kgm)
Shock absorber to linkages (2)	25 Nm (2.5 kgm)
Linkages to frame (3)	50 Nm (5.0 kgm)

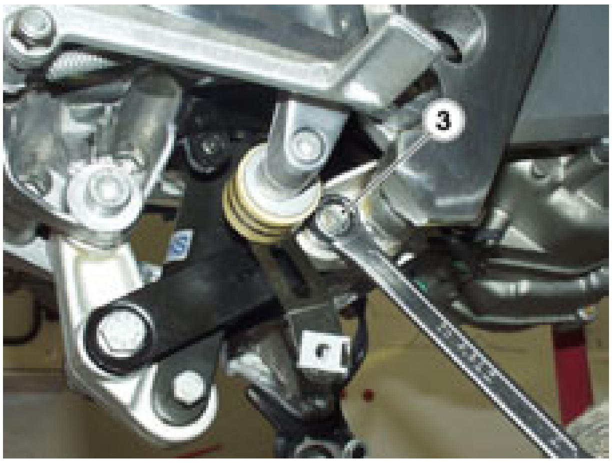
- Position the shock absorber inserting it from the bottom.
- Insert the top bolt of the shock absorber complete with washer from the left-hand side.
- Tighten the nut (1) on the opposite side.



- Position the linkage to the shock absorber.
- Insert the shock absorber bottom bolt from the right-hand side.
- Tighten the nut (2) on the opposite side.



- Locate the double connecting link to its seat in the frame.
- Insert the link-to-frame mounting bolt complete with washer from the left-hand side.
- Tighten the nut (3) on the opposite side.
- Remove the support between swinging arm and seat subframe.



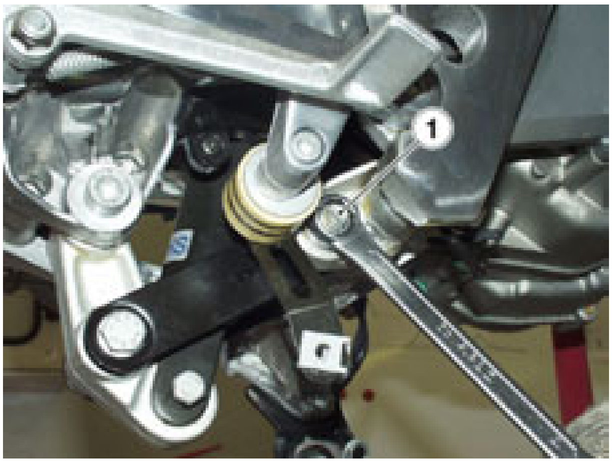
7.12.3. REMOVING THE REAR SUSPENSION LINKAGES

Read 1.2.1 carefully.

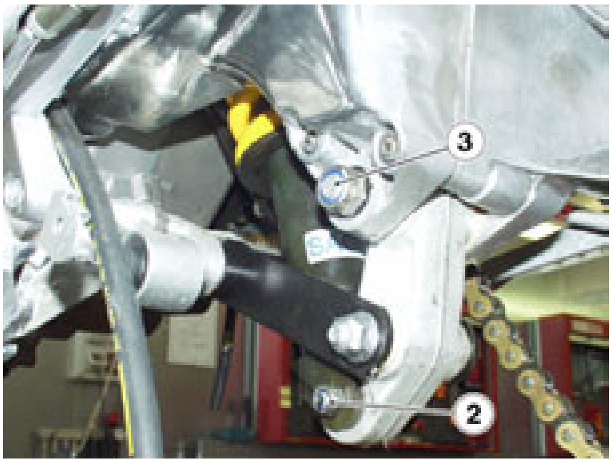
TORQUE WRENCH SETTINGS

Linkages to frame (1)	50 Nm (5.0 kgm)
Shock absorber to linkages (2)	25 Nm (2.5 kgm)
Linkages to swinging arm (3)	80 Nm (8.0 kgm)

- Working from the right-hand side, undo and remove the nut (1).
- Withdraw the bolt on the opposite side and collect the washer.



- Working from the left-hand side, undo and remove the nut (2).
- Withdraw the bolt on the opposite side.
- Working from the left-hand side, undo and remove the nut (3).
- Withdraw the bolt on the opposite side and collect the washer.
- Remove the complete linkage assembly.



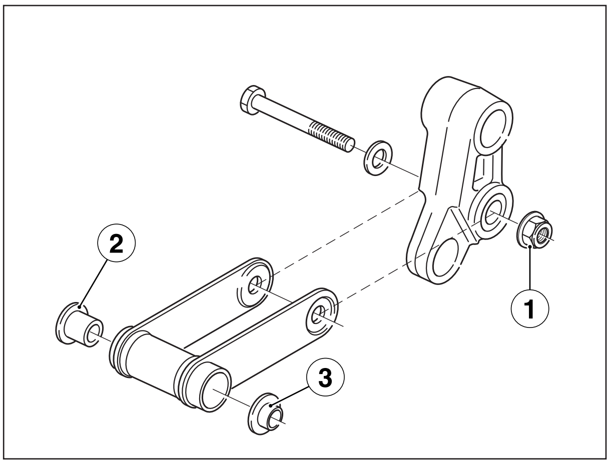
7.12.4. DISMANTLING THE REAR SUSPENSION LINKAGE SYSTEM

Read 1.2.1 carefully.

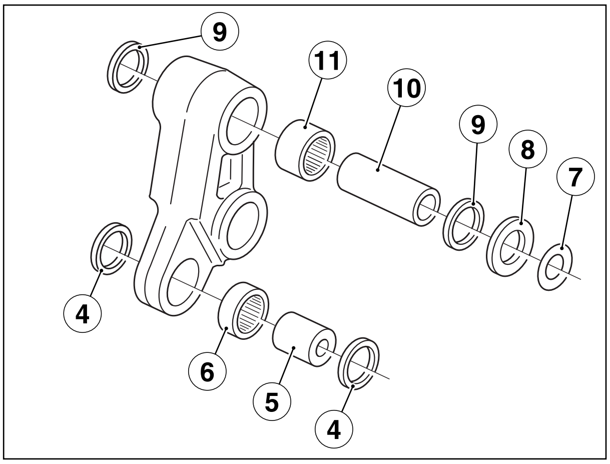
TORQUE WRENCH SETTINGS

Single to double connecting link (1) 50 Nm (5.0 kgm)

- Remove the complete linkage assembly; see 7.12.3.
- Undo and remove the nut (1).
- Withdraw the bolt on the opposite side and collect the washer.
- Remove the single connecting link.
- Remove the right-hand (2) and left-hand bushes (3) from the single connecting link.

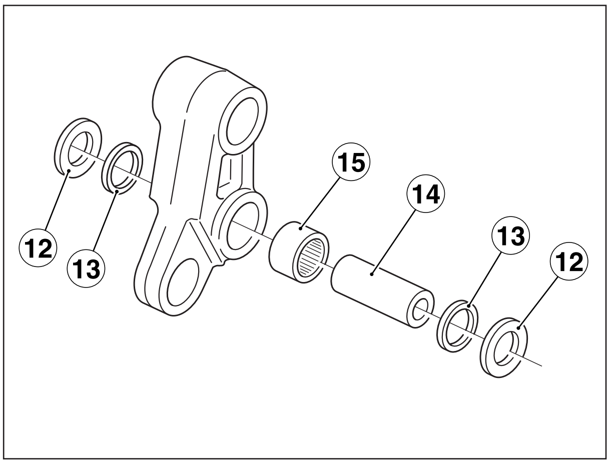


- Remove the oil seals (4) from the double connecting link.
- Withdraw the pin (5).
- Remove the roller bearing (6) using a suitable extractor.
- Remove the Belleville washer (7).
- Remove the seal (8).
- Remove both oil seals (9).
- Withdraw the pin (10).
- Remove the roller bearing (11) using a suitable extractor.



- Remove both seals (12).
- Remove both oil seals (13).
- Withdraw the pin (14).
- Remove the roller bearing (15) using a suitable extractor.

NOTE *Wash all components with clean detergent.*



7.12.5. COMPONENT INSPECTION

NOTE *Visually inspect all components for distortion, damage, cracking and denting. Replace any damaged components.*

ROLLER BEARINGS

Rotate the roller cages manually. They must rotate smoothly, with no hardness or noise.
There should be no end float.
Replace any roller cages that do not meet these requirements.
Apply grease to the bearing rollers; see ☞ 1.8.1.

SEALS

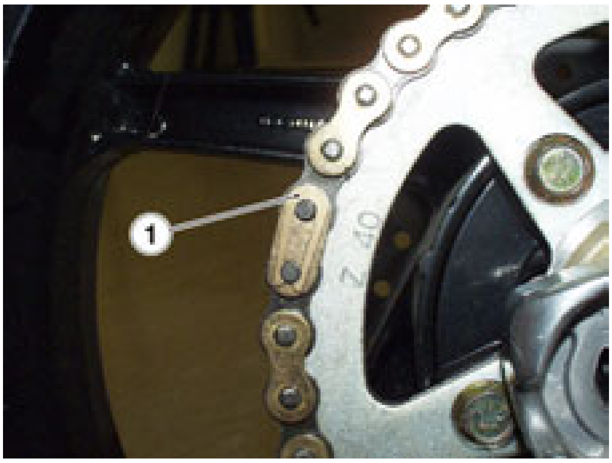
Check the condition of the seals. Replace any damaged or worn seals.

7.13. DRIVE CHAIN

7.13.1. REMOVING THE DRIVE CHAIN

Read ☞ 1.2.1 carefully.

- Slacken the chain; see ☞ 2.21.3.
- Rotate the rear wheel until locating the master link.
- Slip off the clip (1).
- Remove the link plate underneath.



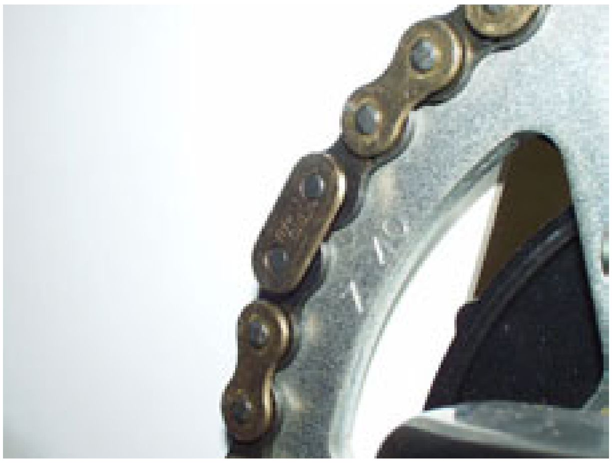
- Remove the master link from the opposite end.
- Remove the chain.

⚠ **WARNING**
When the chain is worn, replace chain and front and rear sprockets as a set. See ☞ 2.21.4.

7.13.2. REFITTING THE DRIVE CHAIN

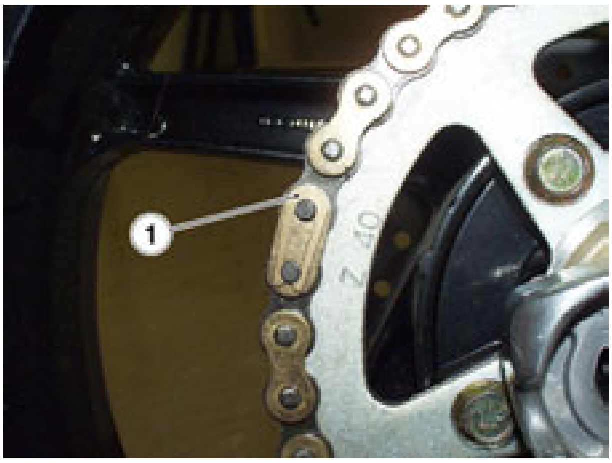
Read 1.2.1 carefully.

- Check that the chain is correctly positioned on the front and rear sprockets.
- The chain open ends should be in the lowermost portion of the chain midway between the sprockets.
- Overlap the two ends and slide the master link pins in place from the inboard side outwards.
- Locate the link plate to the pins.



- Fit the clip (1) to the pins.

WARNING
The master link clip (1) must be installed with the open end pointing away from the direction of chain movement.



ELECTRICAL SYSTEM 8

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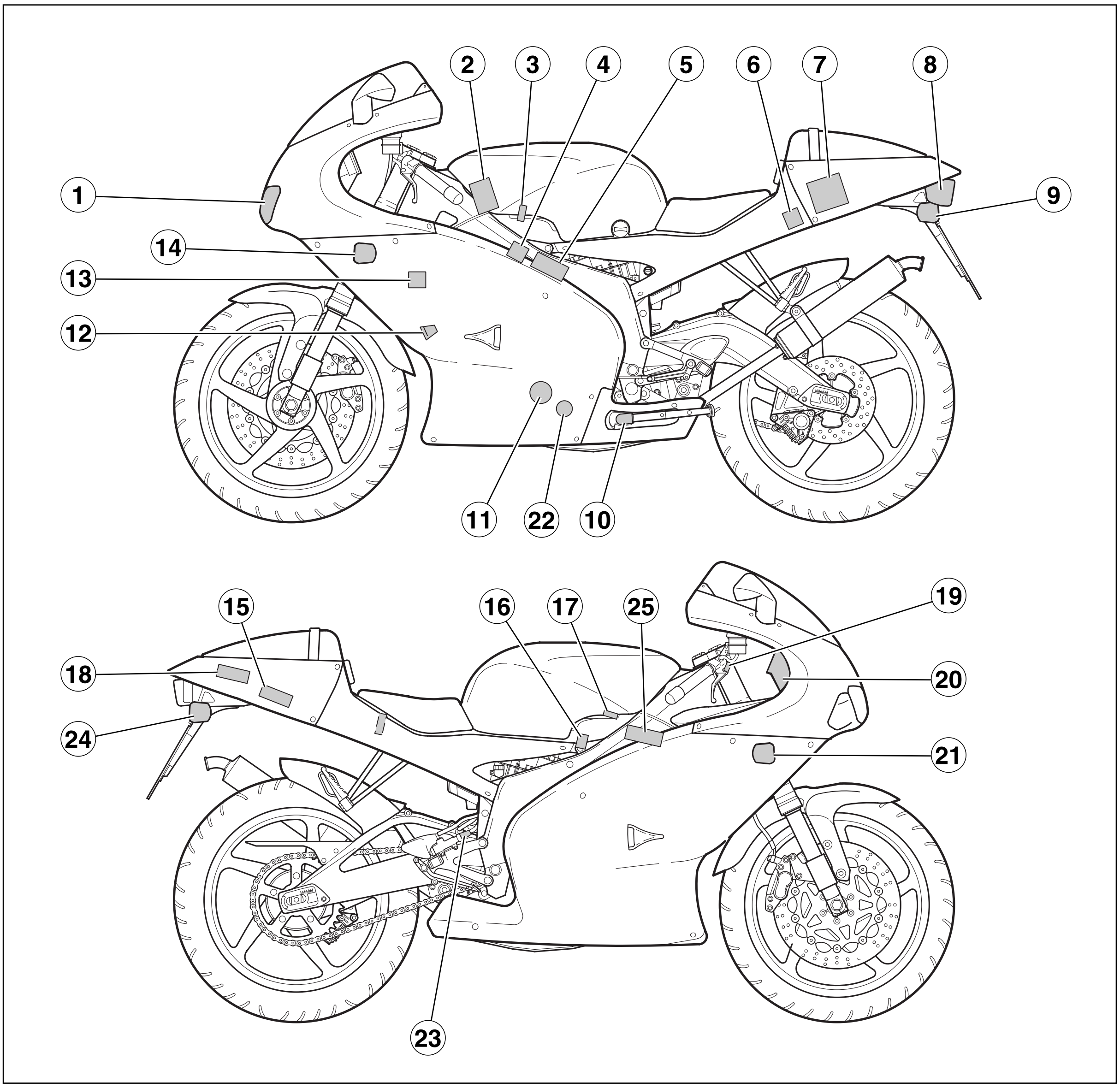
8.1. LAYOUT OF COMPONENTS

8.1.1. LAYOUT OF ELECTRICAL COMPONENTS



Key:

1. Headlight
2. Battery
3. Spark plug
4. Fuses
5. Coil
6. Flasher
7. Voltage regulator
8. Tail light
9. Rear left indicator
10. Side stand switch
11. Starter motor
12. Warning horn
13. Starter relay
14. Front left indicator
15. CDI unit
16. Coolant thermistor
17. Diode
18. RAVE control unit (fp)
19. Front brake light switch
20. Instrument panel
21. Front right indicator
22. Neutral light switch
23. Rear brake light switch
24. Rear right indicator
25. Solenoid

8.2. FOREWORD

8.2.1. FOREWORD

Please read the following information before reading this section.

NOTE *For ease of reference, the same numbering is used in the specific wiring diagrams and in the general schematics.*

WIRING COLOUR CODES

Ar	Orange
Az	Light blue
B	Blue
Bi	White
G	Yellow
Gr	Grey
M	Brown
N	Black
R	Red
Ro	Pink
V	Green
Vi	Violet

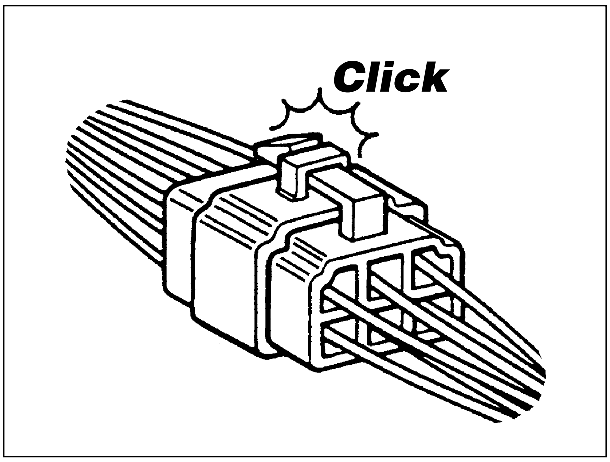
ELECTRICAL CONNECTORS

Disconnect the electrical connectors as follows:

- Press down on the locking tab, where fitted.

⚠ **WARNING**
Never separate two connectors by pulling on the wiring.

- Grasp both connectors and pull them in opposite directions until they become separated.
- Remove any dirt, rust, moisture, etc. from inside the connector blowing with compressed air.
- Ensure that the wires are securely crimped to the terminals inside each connector.



NOTE *A connector will only locate properly into the matching connector when it is inserted in the correct mounting position.*

- When refitting, reconnect the two connectors and ensure that they become fully engaged (where fitted, the locking tab will click audibly into place).

8.3. BATTERY

8.3.1. BATTERY

Battery rating: 12V - 9 Ah

FIRST-TIME INSTALLATION AND MAINTENANCE
Remove the battery from the motorcycle; see ☞ 7.2.1.

- Remove plugs and breather cap.
- Fill cells with fluid having a specific weight of 1.3.
- Slow-charge the battery (at 1/10th of the battery amperage) for at least 10 hours and then refit on the vehicle upon delivery to the customer, i.e. when it is expected to use the vehicle for a certain mileage.
- Fit the battery on the vehicle, connect the terminals and breather hose.
- In case of long inactivity of the vehicle, it is important to charge the battery periodically (at least once a month) for about 10 hours (e.g. during the winter).

Periodically top up (once a month) with distilled water only.

INSPECTION
In the event of abnormal operation, check the charge system first; see ☞ 8.5.1.

- To check the battery:
- Remove the battery from the vehicle, see ☞ 7.2.1 and proceed as follows:

Visually check for:
- extensive sulphation (typically evident due to one or more parts that become white);
- electrolyte level between “MIN” and “MAX” marks;
- leaks from outer casing (housing).

Slow-charge the battery for at least 10 hours.
After the charge, use a densimeter to check electrolyte density in each cell. If density is less than 1.26 in any of the cells or if the loadless voltage is below 12V, replace the battery.

RETURN UNDER WARRANTY
The warranty is invalidated when:

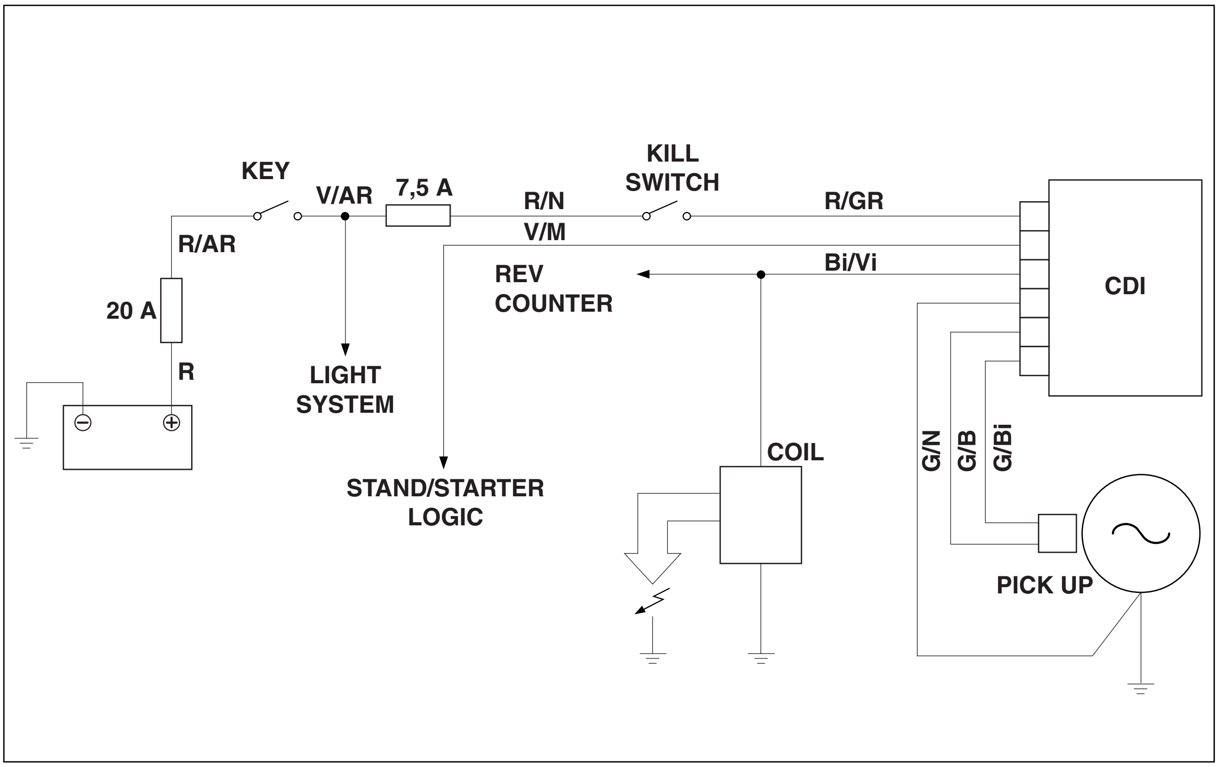
- The battery is damaged (dented housing, bent terminals, etc.);
- The battery is affected by extensive sulphation (normally due to improper installation procedure and/or use).
- Electrolyte low level (for delivery purposes, just fit the relevant rubber plug onto breather port).

SAFETY RULES

⚠ **WARNING**
Battery electrolyte fluid contains sulphuric acid. Keep away from the skin and clothes.
Keep the battery well away from any sources of ignition, such as flames, sparks, or any heat sources because hydrogen output might ignite.

8.4. IGNITION SYSTEM

8.4.1. IGNITION SYSTEM



TROUBLESHOOTING

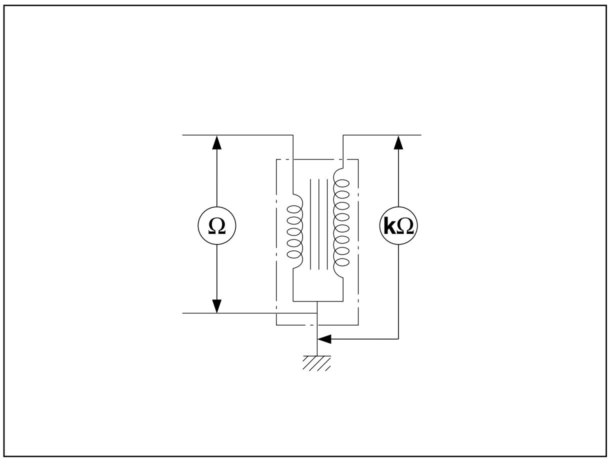
- Check that the 7.5A and 20A fuses are in good condition.
- Check the spark plug and replace as required.
- Check the high-tension cable and the spark plug cover.
- Check the coil.
- Check the pick-up.
- Connect the green-brown wire to ground. If the ignition works, check the stand logic circuit; see 8.12.1.
- Fit a substitute CDI unit known to be operating properly.

TEST READINGS

Ignition coil test

The coils may be checked using a hand-held multimeter. Check for continuity of the primary and secondary windings. The resistance readings found need not match standard values exactly. If the windings are in good working order, resistance readings should approximate the standard values.

Coil winding resistance	
Primary	0.11 – 0.21 ohm
Secondary	4.3 – 8.1 kOhm

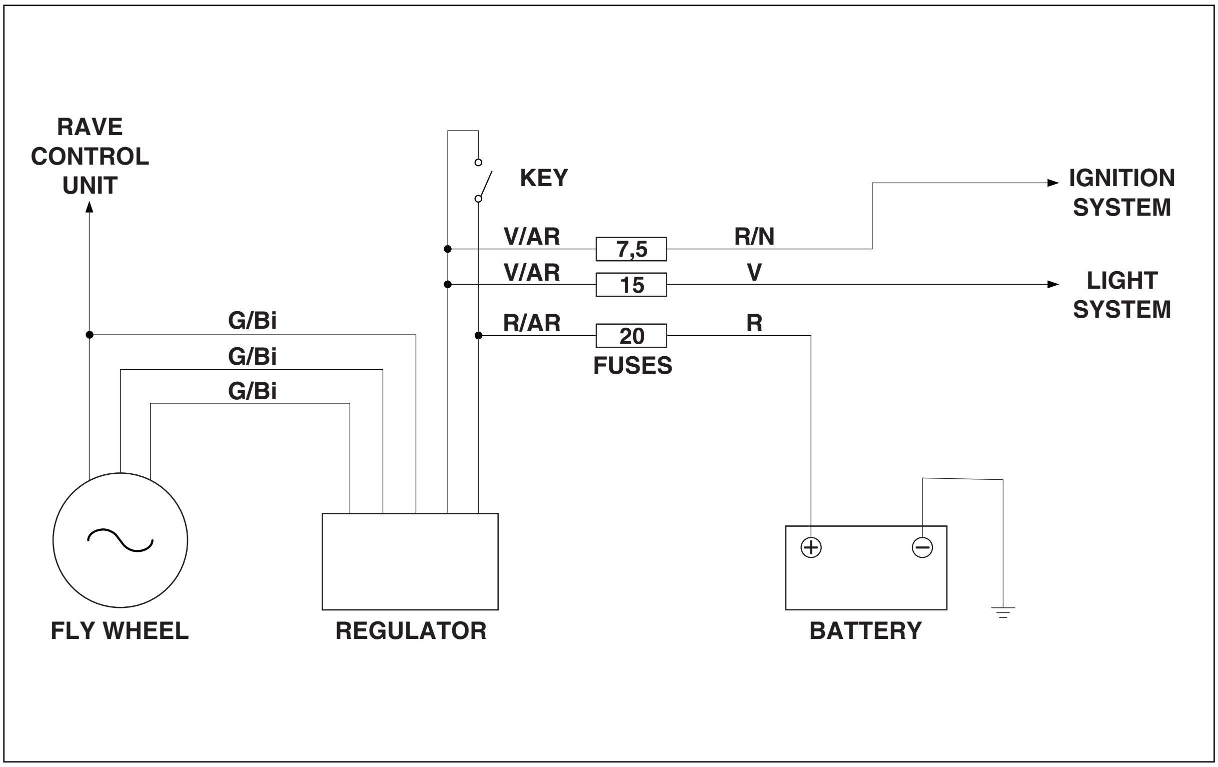


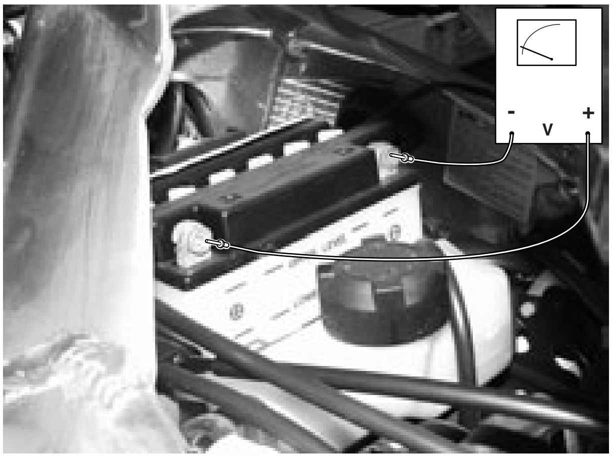
Pick-up test

- Disconnect the connector of the pick-up terminals.
- Measure resistance across the terminals of the yellow/blue and yellow/green wires using a multimeter set to the 1000-ohm range. Correct reading is in the 190-300 ohm range.
- Infinite resistance or a reading below the specified range indicates a faulty pick-up. Replace pick-up.

8.5. CHARGE SYSTEM

8.5.1. CHARGE SYSTEM LAYOUT AND POWER SUPPLY





CHARGE SYSTEM TEST
- Start the engine and rev it up to 6000 rpm.
- Measure DC voltage across battery terminals using a multimeter set to the DC voltage scale.
- Switch on the low beam lights.
- Correct voltage reading is 13.5 to 15 Volts.

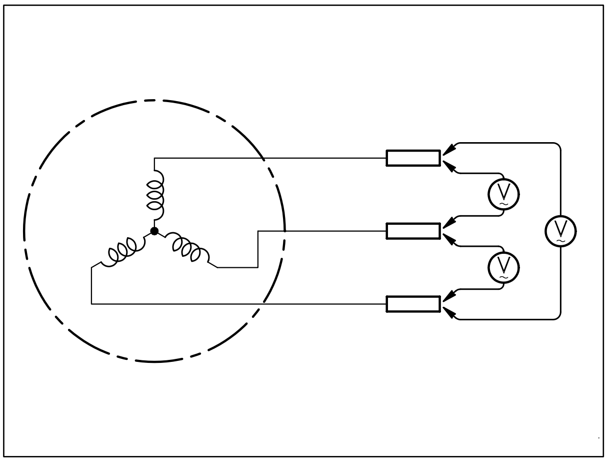
TROUBLESHOOTING
- Check the condition of the 20A fuse.
- Check the connections of flywheel, regulator and fuse leads.
- Check the flywheel.
- Check the battery; see 8.3.1.
- Replace the regulator with one known to work properly.

TEST READINGS

Flywheel test

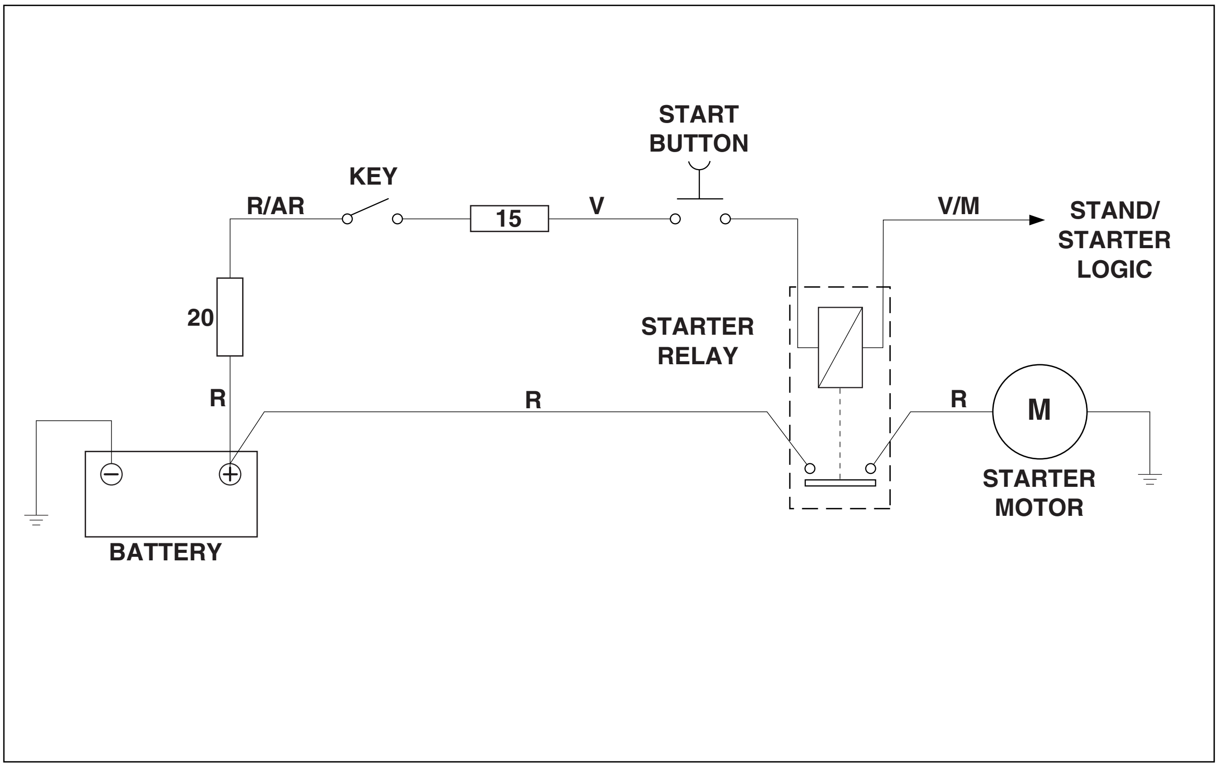
- Disconnect the alternator wiring connector.
- Start the engine and rev it up to 5,000 rpm.
- Measure AC voltage across the three yellow wires using a hand-held multimeter. A reading below 53 V indicates a faulty alternator.

Standard loadless voltage: over 53 VAC at 6000 rpm.



8.6. STARTER CIRCUIT

8.6.1. STARTER CIRCUIT



TROUBLESHOOTING

- Check the condition of the fuses.
- Check the starter button.
- Check the starter relay.
- Check the starter motor.
- Connect the green-brown wire to ground. If the starter is still working, check the stand/starter logic circuit; see 8.12.1.

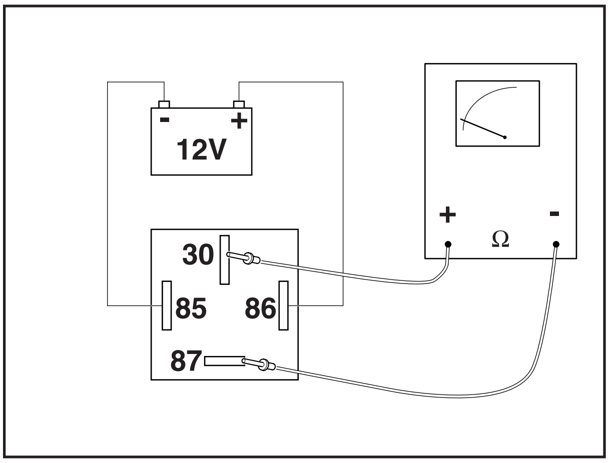
TEST READINGS

Starter relay test

- To test relay operation:
- Feed 12 Volts to the two male terminals (85 - 86).
- Check for continuity between the other two terminals (87 – 30) using a multimeter set to the ohm range.

Correct reading when relay is fed: 0 Ω
Correct reading when relay is not fed:∞ Ω

Replace the relay under testing if the readings obtained deviate from those specified.



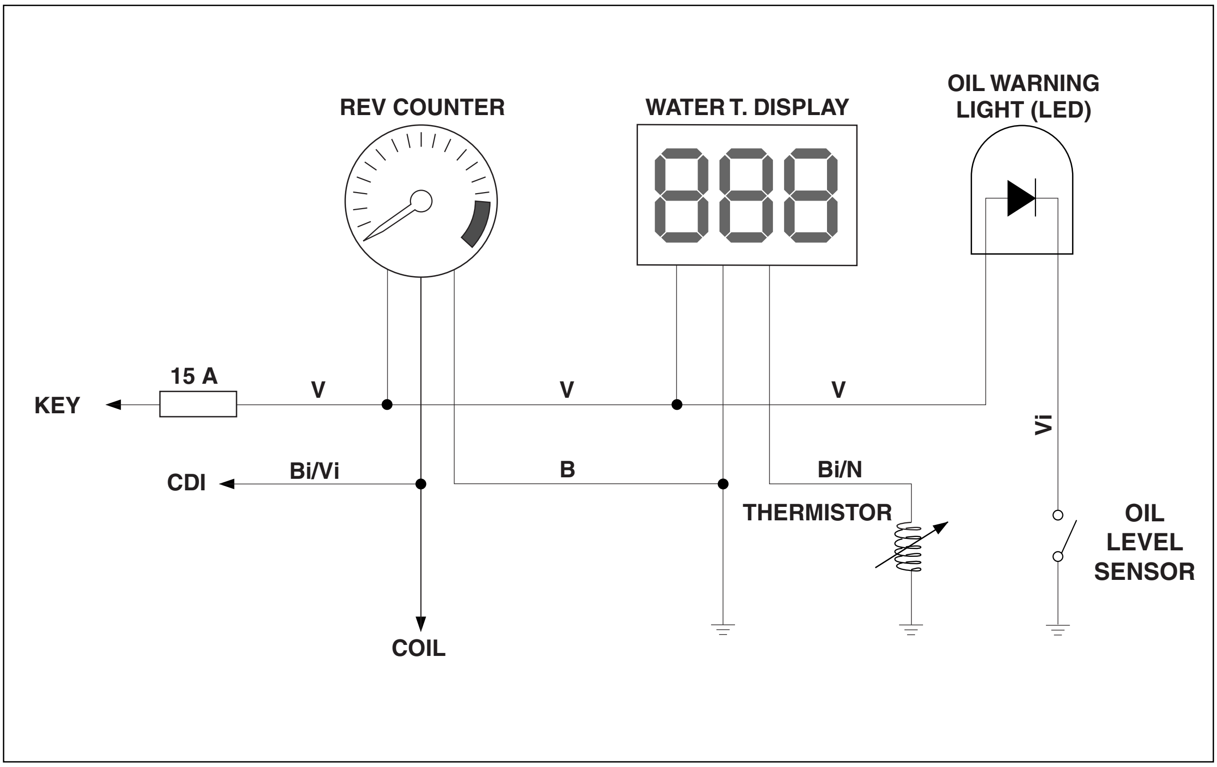
Starter motor test

- Connect a 12-V 9-AH battery to the starter motor.
- Measure current draw during regular operation (after 5 seconds) using a DC ampere meter.

Correct reading: 50 - 60 A.

8.7. SENSORS AND REV COUNTER

8.7.1. SENSORS AND REV COUNTER CIRCUIT



TROUBLESHOOTING

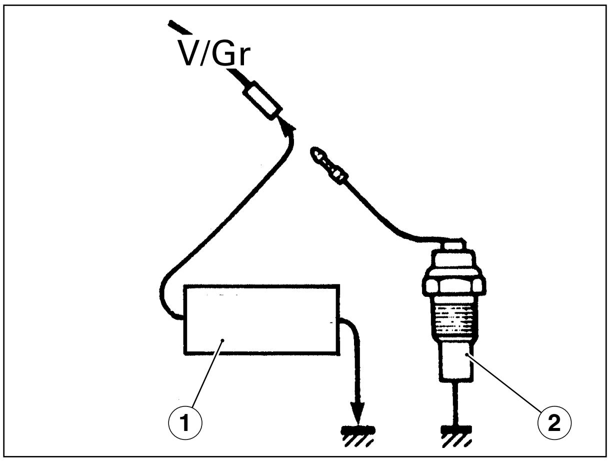
- Check the condition of the 15A fuse.
- Check wiring connection.

Rev counter

- Fit a substitute rev counter known to operate properly.

Coolant temperature

- Disconnect the green-grey terminal wire and connect three resistors rated 1,000 Ω, 50 Ω and 15 Ω, respectively as shown.
- When the ignition key is turned to ON, the following temperature readings or messages will appear on the display.



Resistor rating	Display indication
1,000 Ω	COLD
50 Ω	90-95° C
15 Ω	120-130° C

- If display indications are correct, change the thermistor.
- Otherwise change the display.

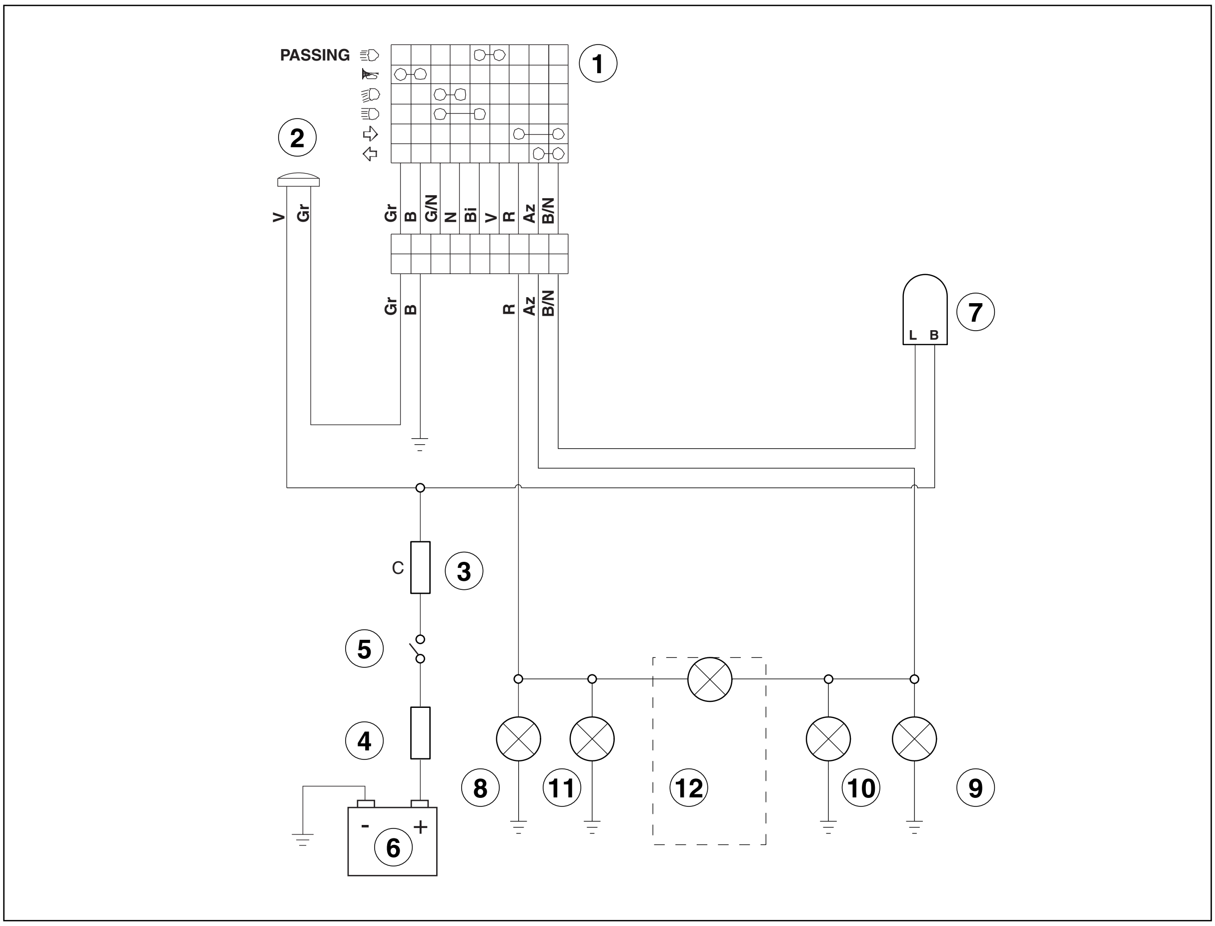
Key:
1) Resistor
2) Thermistor

Oil level sensor test

- Disconnect all leads at the wiring harness end and remove the sensor from the frame.
- Attach a multimeter set to the ohm range to the sensor.
- Hold sensor vertically. Correct reading: 0 Ω.
- Turn sensor over. Correct reading: infinite resistance.

8.8. VISUAL AND ACOUSTIC SIGNALS

8.8.1. VISUAL AND ACOUSTIC SIGNALLING SYSTEM



Key:

1. Left-hand light dip switch
2. Warning horn
3. Fuse (15A)
4. Fuse (20A)
5. Key
6. Battery
7. Flasher
8. Rear right indicator bulb
9. Rear left indicator bulb
10. Front right indicator bulb
11. Front left indicator bulb
12. Indicator light

Warning horn test

To test warning horn operation:

- Feed 12 Volts to the two connectors of the warning horn.
- Adjust through the adjuster screw if needed.

Flasher test

When none of the direction indicators is working, there might be a problem with the flasher.

To test flasher operation:

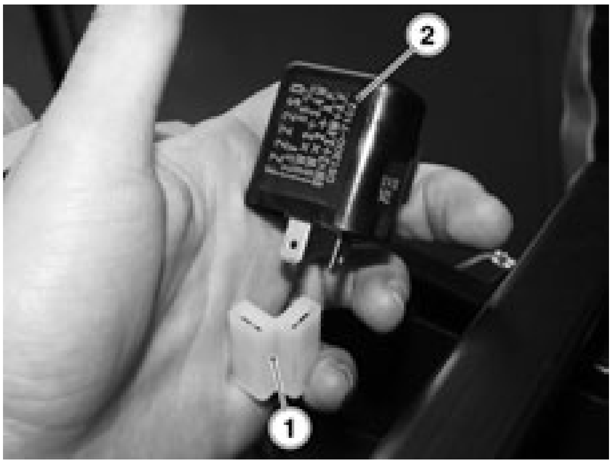
- Disconnect the connector (1) of the flasher (2).
- Fit a jumper across connector (1).
- Operate the direction indicator control (3).

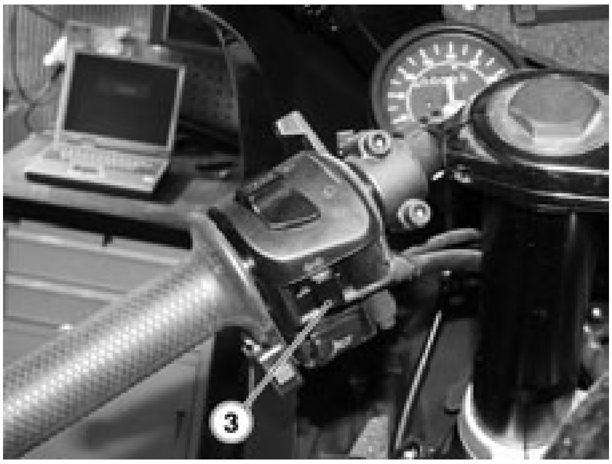
If the indicator lights come on but do not flash, replace the flasher (2).

- It may also be necessary to check:

the 20-A main fuses and the electrical system.

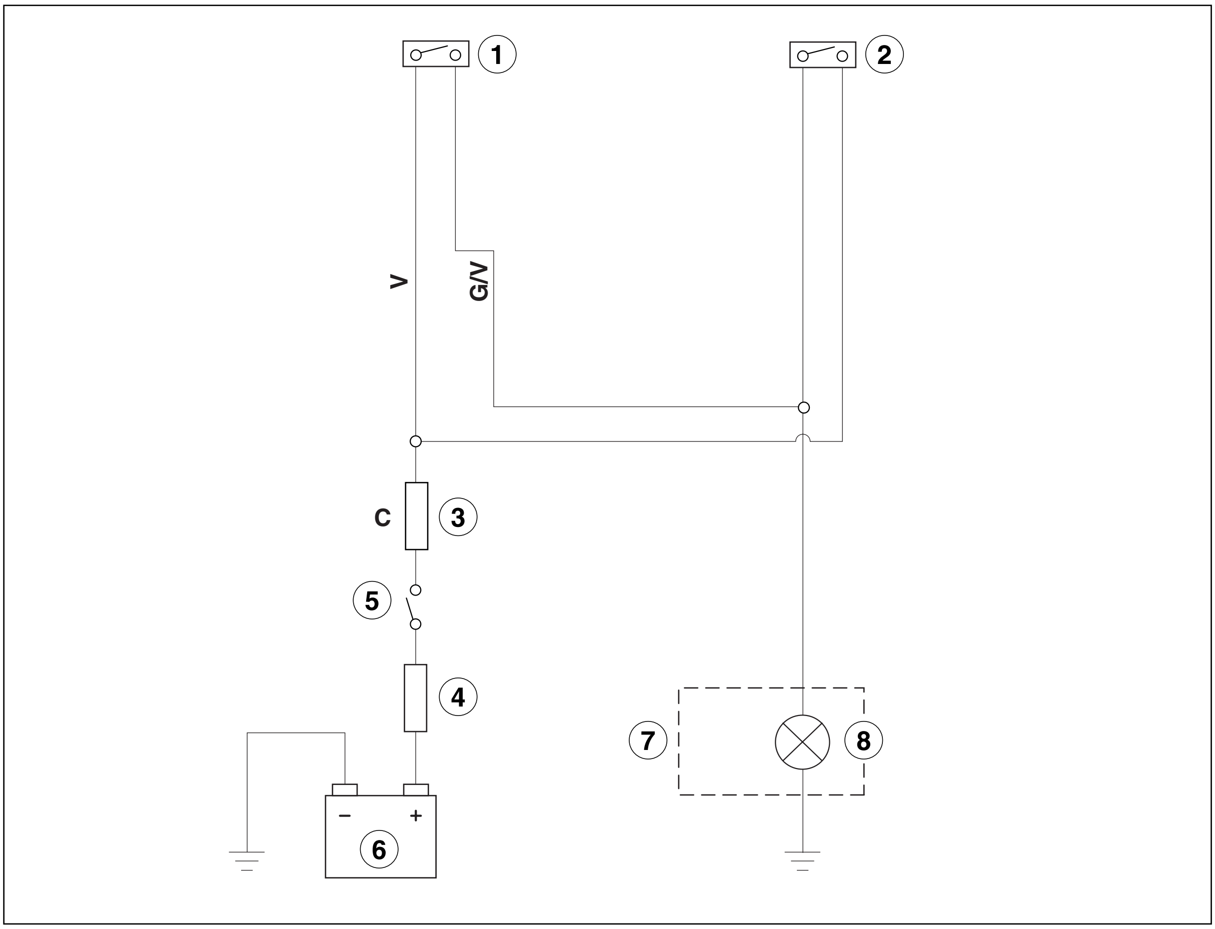
When the bulb of a direction indicator burns out, each time the control (3) is operated the other indicator and the repeater light on the instrument panel will come on but will not flash.





8.9. BRAKE LIGHTS CIRCUIT

8.9.1. BRAKE LIGHTS CIRCUIT



Key:

1. Front brake light switch
2. Rear brake light switch
3. Fuse (15 A)
4. Fuse (20 A)
5. Key
6. Battery
7. Tail light
8. Brake lights

TROUBLESHOOTING

- Check the condition of the 15A and 20A fuses.
- Check the condition of the brake light bulb.

Switches

Check switches for continuity using a multimeter. Please refer to the relevant diagram.

Replace any switch assembly found to deviate from the specified mode of operation.

Front brake light switch

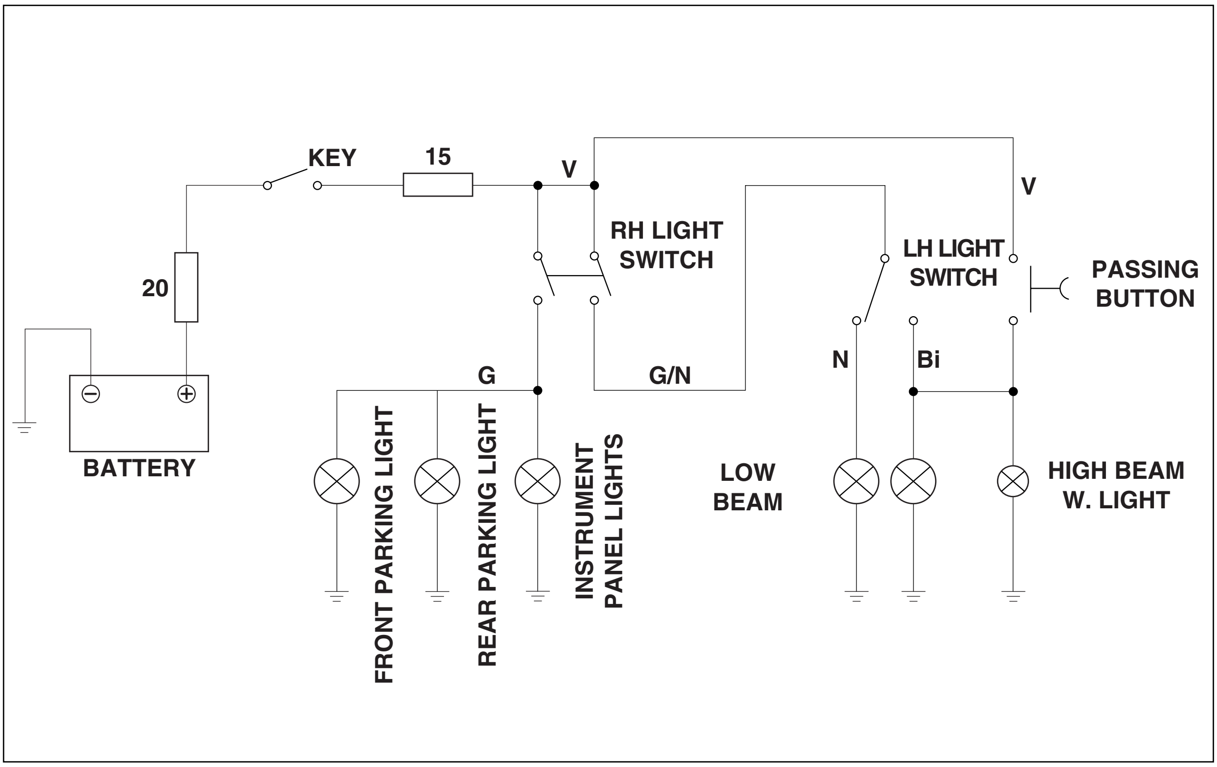
Position	Wires	
	V	V/G
Activated	○—	—○

Rear brake light switch

Position	Wires	
	V	V/G
Activated	○—	—○

8.10. LIGHT CIRCUIT

8.10.1. LIGHT CIRCUIT

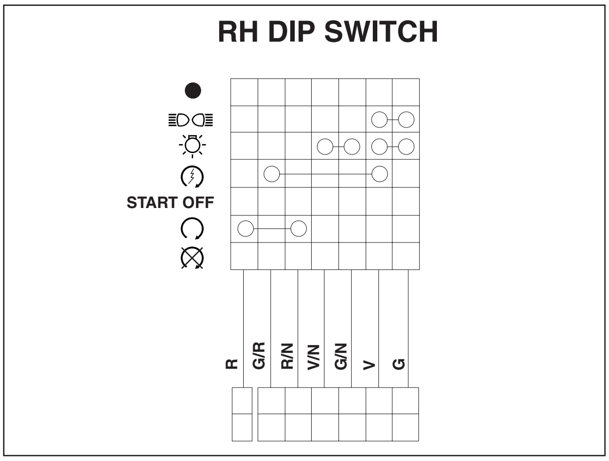


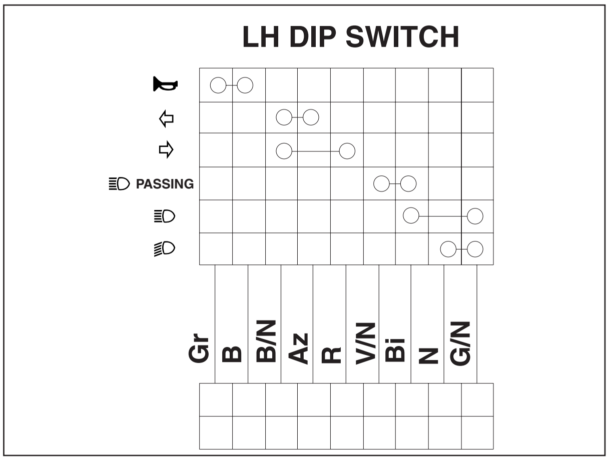
TROUBLESHOOTING

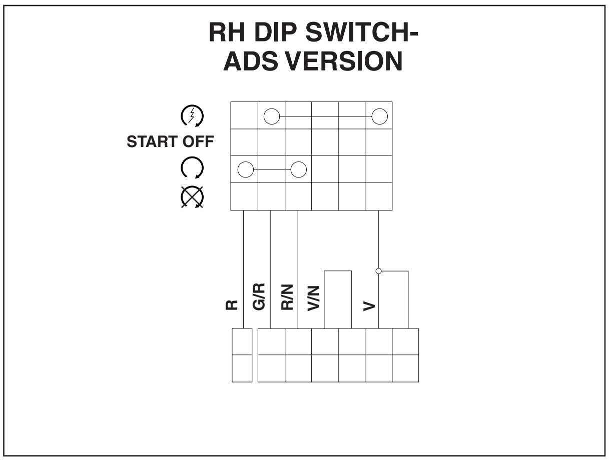
- Check the condition of the 15A and 20A fuses.
- Check the right and left light dip switches for proper operation.
- Check bulb operation.

LIGHT DIP SWITCH TEST

Check for continuity across the contacts using a multimeter set to the ohm range. Please refer to the relevant diagram.

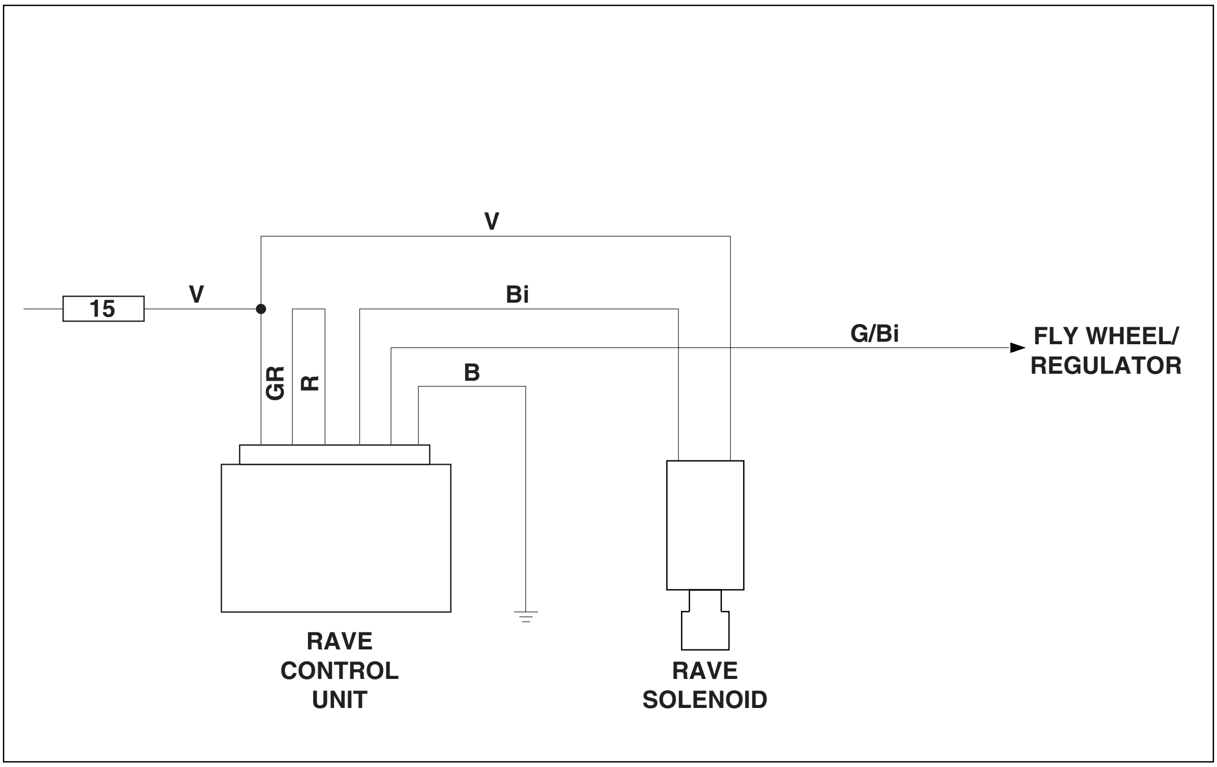

RH DIP SWITCH


LH DIP SWITCH


RH DIP SWITCH-
ADS VERSION

8.11. RAVE VALVE

8.11.1. RAVE VALVE CIRCUIT



The RAVE control unit operates the solenoid to open the valve at the exhaust end at 8100 rpm.

TROUBLESHOOTING

- Check the condition of the 15 A fuse.
- Attach a 12V battery direct to the solenoid to check for proper operation.
- Check the flywheel; see 8.6.1.
- Fit a substitute regulator known to operate correctly.
- Fit a substitute RAVE control unit known to operate correctly.

WARNING
Cut the jumper across the grey and red wires of the RAVE control unit and the solenoid will operate the valve at 7,800 rpm.

CONTROL UNIT

- Remove the fuel tank; see ☞ 4.1.1.
- Remove the battery and battery box mount together; see ☞ 7.2.1.
- Disconnect the connector.
- Start the engine and switch on the low beam.
- Speed up engine up to 2500 rpm.
- Measure voltage across the green (V) and blue (B) wires using a multimeter:

Correct reading = 12.25 ± 1 VDC.

- Measure voltage across the yellow (G) and blue (B) wires using a multimeter:

Correct reading = 8.5 ± 1 VAC.

NOTE *Any readings other than the specified values indicate a fault in the system, not in the control unit.*

SOLENOID

- Check that the piston moves freely.
- Start the engine and let it idle.
- Measure resistance across the wires using a multimeter:

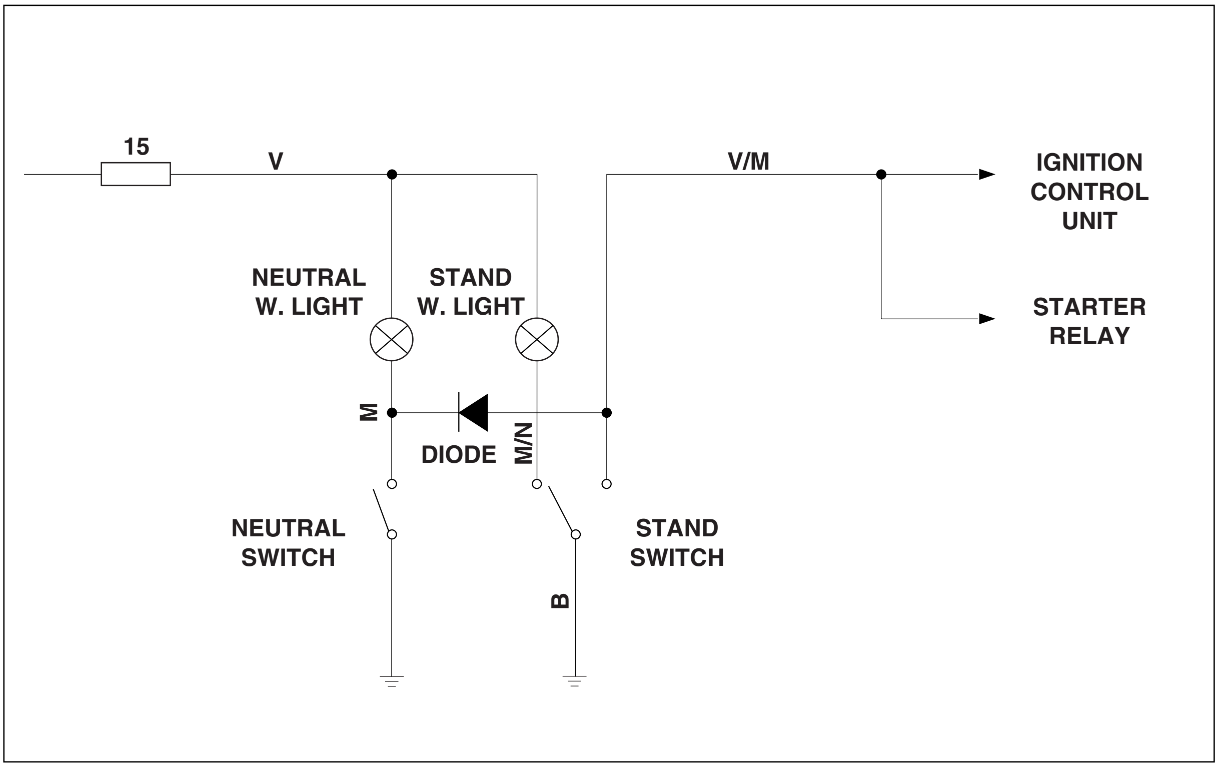
Correct reading = 2.2 Ohms ± 10%.

- Measure voltage across the solenoid wires using a multimeter:

Correct reading = 11.5 ± 1 V at idling speed during a single one-second pulse. After this initial pulse, reading should drop to 5.5 ± 1 VDC.

8.12. STAND

8.12.1. STAND LOGIC CIRCUIT



Engine starting and ignition are inhibited when the stand is down and/or a gear is engaged.

TROUBLESHOOTING

- Check the condition of the 15 A fuses.
- Check the neutral light switch.
- Check the stand switch.
- Check the diode.
- Check the starter relay; see 8.6.1.
- Fit a substitute CDI unit known to be operating correctly.

TEST READINGS

Check for continuity across the contacts using a multimeter set to the ohm range. Refer to the diagrams below.

Neutral light switch test

Pos.	Wires	
	SCREW	V/G
Neutral	○—	—○

Stand test

Stand position	Wires		
	M	V	N
Down	○—	—	—○
Up		○—	—○

DIODE TEST

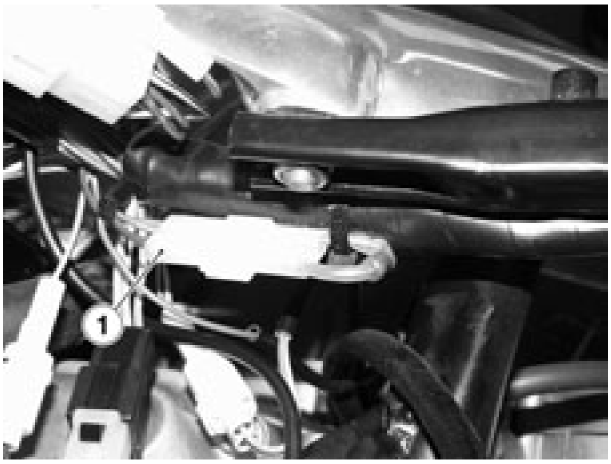
To test diode operation:

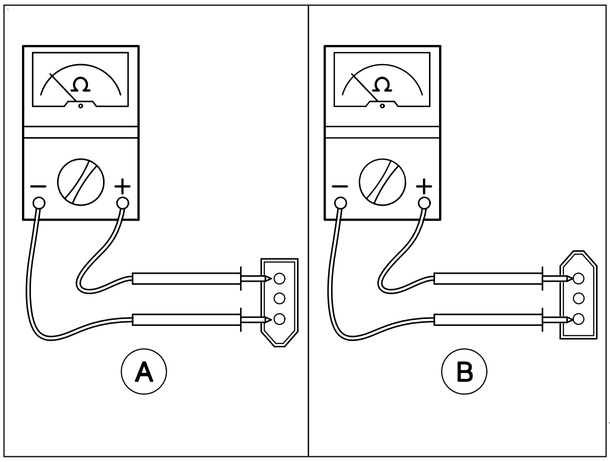
- Disconnect the two-way connector (1) (coloured white).

WARNING
Make sure to refit the connector (1) to the matching connector on assembly

.

Place a multimeter in the diode-test mode and measure across the two male terminals accommodated inside the diode as shown in the diagram.

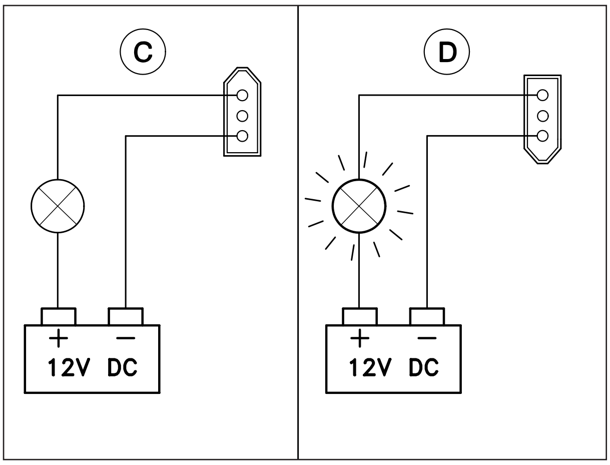




Correct reading (layout A): 0 – 1 Ω.
Correct reading (layout B): ∞.

If your multimeter does not include a diode-test feature, feed 12 Volts to the diode, fit a 12 V - 2 W bulb to the positive lead and connect the leads to the diode as shown in the diagram.

WARNING
Do not use a bulb rated higher than 2 W or the diode will damage.



Test (C): the bulb stays off.
Test (D): the bulb comes on.

8.13. BULB REPLACEMENT

8.13.1. BULB REPLACEMENT

Read ☞ 1.2.1 carefully.

WARNING
Before proceeding to change a bulb, rotate the ignition switch to “⊗” .
Wear clean gloves or use a clean, dry cloth to handle bulbs. Do not put your fingerprints on a bulb, as this may cause overheating leading to failure. If you happen to touch a bulb with your fingers, remove any fingerprints with alcohol to avoid early failure.
DO NOT PULL ON THE WIRING.

- Place the motorcycle on the stand.

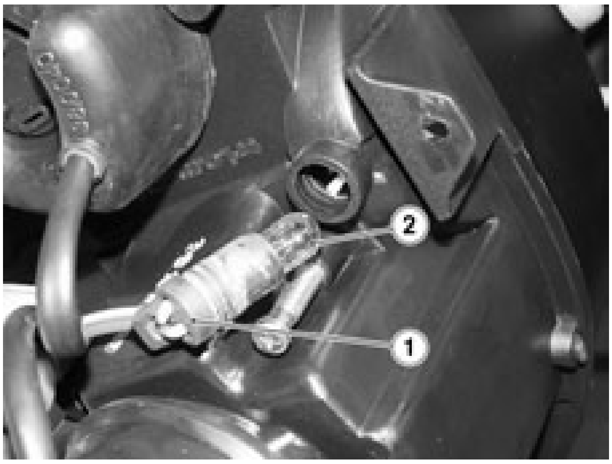
NOTE *Check the fuses before changing a bulb; see ☞ 8.14.1.*

Replacement procedures:

PARKING LIGHT BULB

WARNING
Never pull on the wiring to extract a bulb holder.

- Working from the rear end of the front fairing, grasp the bulb holder (1) and pull until clear of its seat.
- Withdraw the parking light bulb (2) and fit a new bulb of equal rating.

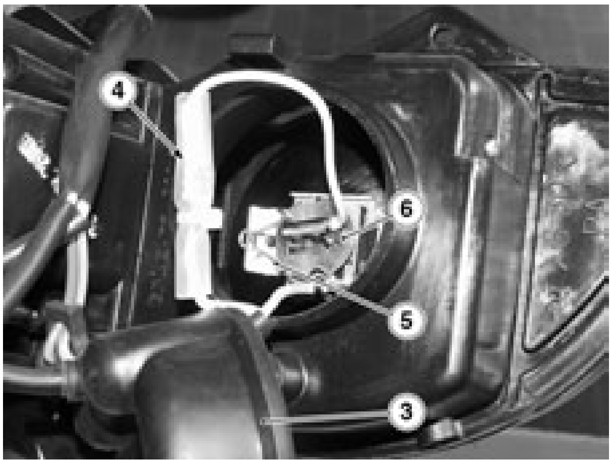


HIGH BEAM BULB

- Working from the rear right end of the front fairing, slip off the dust cover (3) with your fingers.
- Withdraw the electrical connector (4).
- Release the retainer (5) at the rear of the bulb holder (6).
- Extract the bulb.

NOTE *Make sure the locating pegs locate properly into the holder when fitting the bulb.*

- Fit a new bulb of equal rating in the correct position.

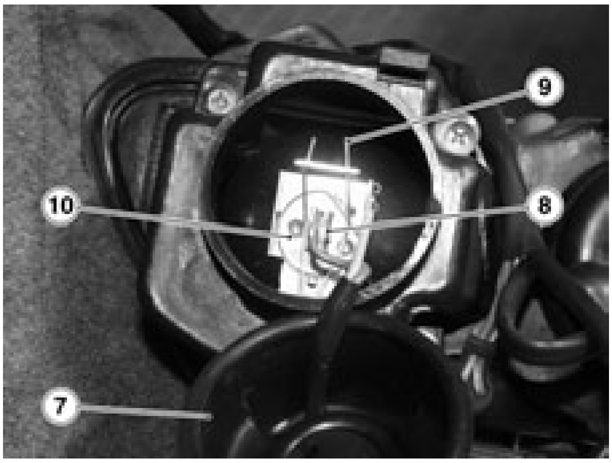


LOW BEAM BULB

- Working from the rear left end of the front fairing, slip off the dust cover (7) with your fingers.
- Withdraw the connector (8).
- Release the retainer (9) at the rear of the bulb holder (10).
- Extract the bulb.

NOTE *Make sure the locating pegs locate properly into the holder when fitting the bulb.*

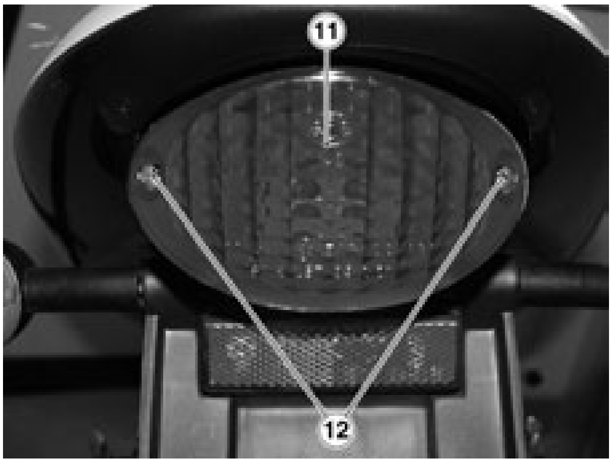
- Fit a new bulb of equal rating in the correct position.



TAIL LIGHT BULBS

NOTE *Check the BRAKE light switches for proper operation before changing a bulb; see 8.9.1.*

- Place the motorcycle on the stand.
- Release and remove the two screws (12).
- Remove the guard (11).

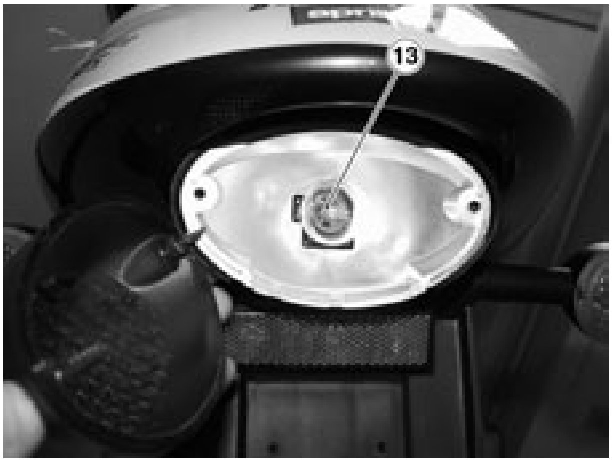


- Push the bulb (13) gently and twist anti-clockwise.
- Extract the bulb (13).

WARNING
Fit the bulb into the bulb holder making sure the two bulb pegs locate into the slots in the bulb holder.

- Fit a new bulb of equal rating in the correct position.

NOTE *On refitting, make sure the guard locates correctly into its seat. Tighten the screws (12) carefully and do not overtighten to avoid damage to the guard.*



FRONT AND REAR INDICATOR BULBS

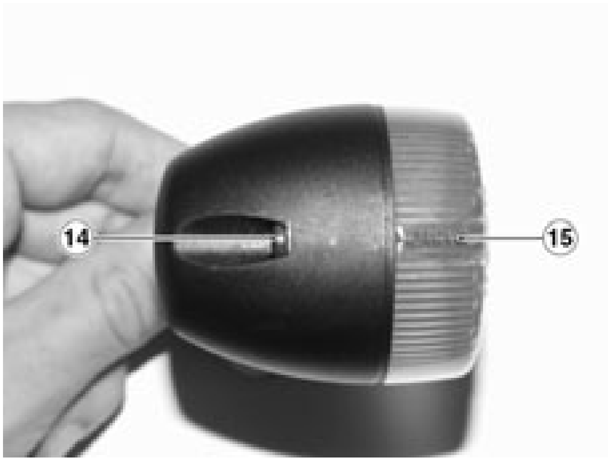
- Place the motorcycle on the stand.
- Release and remove the screw (14).

NOTE *Be careful when removing the guard, or the locating tab might break off.*

- Remove the guard (15).

NOTE *On refitting, make sure the guard locates correctly into its seat. Tighten the screw (14) carefully and do not overtighten to avoid damage to the guard.*

Push the bulb (16) gently and twist anti-clockwise.

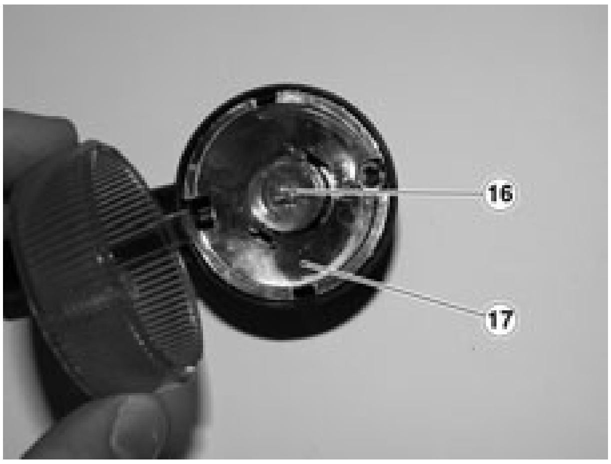


- Extract the bulb.

NOTE *Make sure the locating pegs locate properly into the slots in the bulb holder when fitting the bulb.*

- Fit the new bulb of equal rating in the correct position.

NOTE *In the event the bulb holder (17) comes off, refit it correctly with the slotted open end matching the screw hole.*



8.14. REPLACING THE FUSES

8.14.1. REPLACING THE FUSES

WARNING
Never attempt to repair a defective fuse.
Never use a fuse of a rating other than specified.
This could damage the electrical system or cause a short circuit, with the risk of fire.

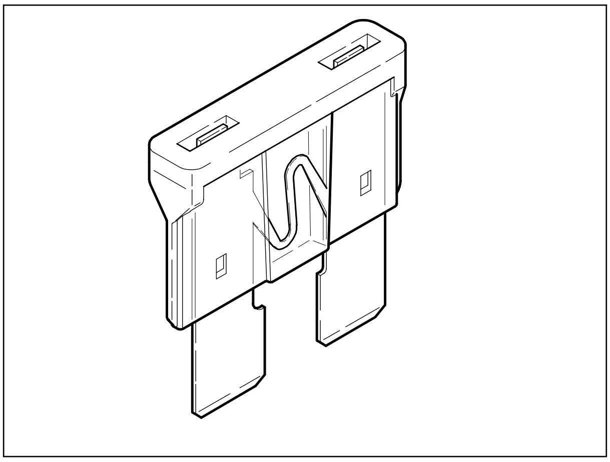
NOTE *When the fuses fitted in a particular position keep blowing frequently, there might be a short circuit or overloading.*

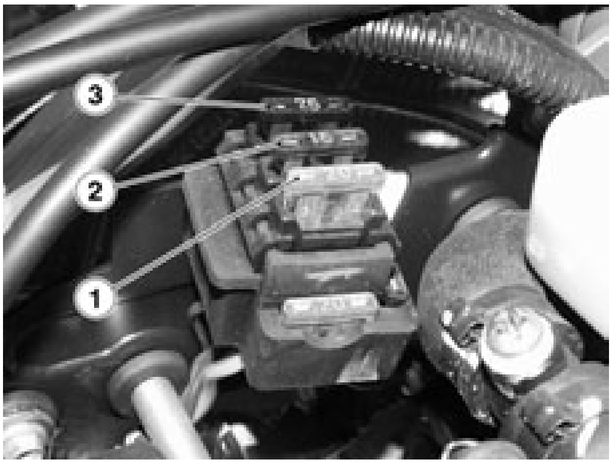
Checking the fuses is recommended whenever an electrical component fails to operate or is malfunctioning, or when the engine does not start.

- Set the ignition switch to “⊗”. This will prevent accidental short circuits.
- Lift the fuel tank; see 2.9.1.

NOTE *When the 20A fuse is removed, the digital clock will be reset to zero. Please read 2.3.1 for instructions on how to set the clock again.*

- Extract all fuses one by one and check for blown fuses.
- When you find a blown fuse, determine and rectify the cause (if possible) before fitting a new fuse.
- Replace any failed fuses with a fuse of equal current rating.





NOTE *When you use one of the spare fuses, remember to add a new fuse of equal rating to the spare fuse holder.*

ARRANGEMENT OF THE FUSES

9. 20-A fuse

From battery to ignition switch, voltage regulator and clock.

10. 15-A fuse

From ignition switch to all light loads and warning horn, solenoids **(fp)** and RAVE motor.

11. 7.5-A fuse

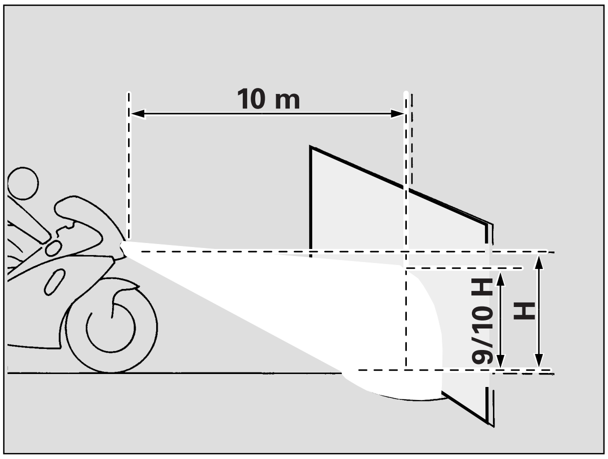
From ignition switch to ignition and starter lockout system.

NOTE *There is one spare fuse.*

8.15. BEAM SETTING

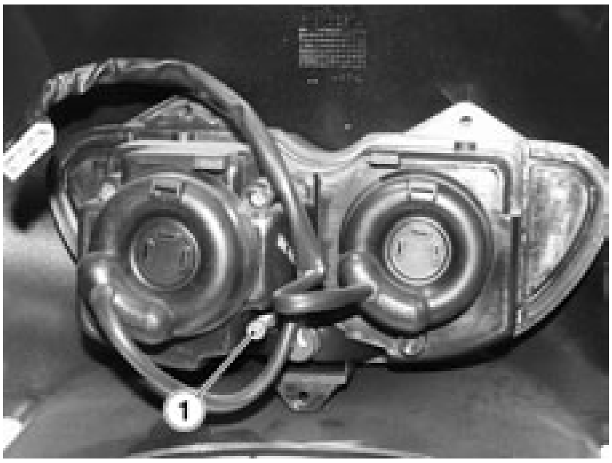
8.15.1. BEAM HEIGHT SETTING

This is a quick beam-setting inspection procedure. Place the motorcycle ten metres away from a vertical wall. It is important that the motorcycle be on level ground.
Switch on the low beam and sit astride the motorcycle. The light spot on the wall should be just below the horizontal line of the headlight (about nine/tenths of overall height).



To set beam height:

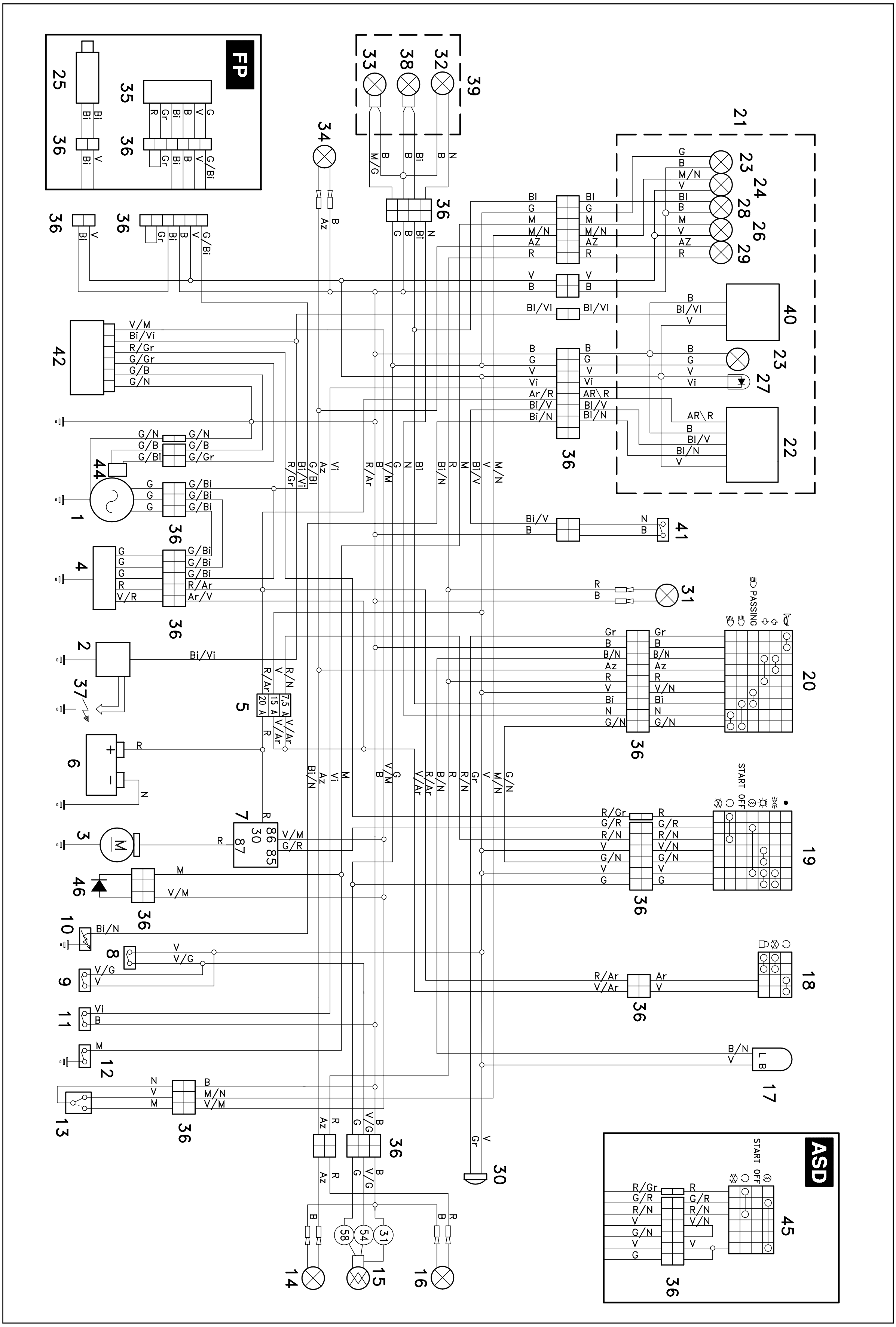
- Working from the rear left end of the front fairing, turn the adjuster screw using a short Phillips screwdriver:



TURN IN (clockwise) to raise the beam.
TURN OUT (anti-clockwise) to lower the beam.

8.16. WIRING DIAGRAM

8.16.1. WIRING DIAGRAM



Key:

1. Generator
2. Ignition coil
3. Starter motor
4. Voltage regulator
5. Fuses
6. Battery
7. Starter relay
8. Front brake light switch
9. Rear brake light switch
10. Coolant thermistor
11. Mixer oil reserve sensor
12. Neutral light switch
13. Side stand switch
14. Rear left direction indicator
15. Tail light
16. Rear right direction indicator
17. Flasher
18. Ignition switch
19. Right light dip switch
20. Left light dip switch
21. Complete instrument panel
22. Multi-function display
23. Instrument panel lights
24. Side stand down light
25. Solenoid
26. Neutral light
27. Mixer oil low light (LED)
28. High beam pilot light
29. Indicator repeater light
30. Warning horn
31. Front right direction indicator
32. Low beam lamp
33. Front parking light
34. Front left direction indicator
35. RAVE control unit
36. Multiple connectors
37. Spark plug
38. High beam lamp
39. Headlight
40. Electronic rev counter
41. LAP button
42. CDI unit
43. Pick-up
44. Right light dip switch
45. Diode

WIRE COLOUR CODES

Ar	Orange
Az	Light blue
B	Blue
Bi	White
G	Yellow
Gr	Grey
M	Brown
N	Black
R	Red
Ro	Pink
V	Green
Vi	Violet

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TROUBLESHOOTING INFORMATION 9

SUMMARY

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9.1. TROUBLESHOOTING INFORMATION

9.1.1. ENGINE

Trouble	Symptom and possible causes	Remedy
Engine does not start or is difficult to start	**Low compression**	
	Cylinder or piston rings exceedingly worn.	Replace.
	Piston ring sticking in its groove.	Repair or replace.
	Crankcase, cylinder or cylinder head gasket leaking.	Repair or replace.
	Loose spark plug.	Tighten
	Piston broken, cracked or damaged.	Replace..
	Crankshaft seal worn.	Replace.
	No spark	
	Foul spark plug.	Replace.
	Wet spark plug..	Clean and dry
	Defective coil.	Replace.
	High-tension cable interrupted or shorted.	Replace.
	Ignition system fault.	Repair or replace.
	Carburetor is receiving no fuel	
	Breather hole in filler cap clogged.	Clean.
	Fuel cock clogged or defective.	Clean or replace.
	Carburetor needle valve defective.	Replace.
	Fuel tube obstructed.	Clean.
	Foul spark plug..	Clean
	Ignition system fault.	Repair or replace.
	Fuel tube obstructed.	Replace.
	Carburetor jets obstructed.	Clean.

Engine is burning oil	Oil pump out of adjustment.	Adjust.
	Crankshaft seal damaged or worn.	Replace.
Loss of engine power	Piston rings or cylinder worn.	Replace.
	Incorrect air gap between spark plug electrodes or ignition system faulty.	Adjust or replace.
	Carburetor jets obstructed.	Clean.
	Incorrect fuel level in carburetor float chamber.	Adjust.
	Air cleaner clogged.	Clean.
	Air leaking past the intake duct.	Tighten or replace.
	Engine is receiving too much oil.	Adjust the oil pump.
Engine overheats	Too much carbon build-up on piston crown.	Clean.
	Engine is receiving insufficient oil.	Adjust the oil pump..
	Oil pump faulty or oilways obstructed.	Replace or clean.
	Fuel level in carburetor float chamber too low.	Adjust.
	Air leaking into intake duct.	Tighten or replace.
	Engine oil used does not meet specification.	Use specified oil..
	Cooling system faulty.	Read radiator section.

9.1.2. CARBURETOR

Trouble	Symptom and possible causes	Remedy
Difficulties on starting	Starter jet obstructed.	Clean.
	Starter duct obstructed.	Clean.
	Air leaking past the gasket between cold-start body and carburetor.	Check and tighten.
	Cold-start shutter is malfunctioning.	Repair.
Erratic operation at idling speed or in the low speed range	Idle jet obstructed or loose.	Check and clean..
	Air leaking past the S.I.P.C. tube of carburetor or cold-start device.	Check.
	Idle outlet or by-pass hole obstructed.	Check and clean.
	Cold-start shutter does not close fully.	Check and adjust.
Erratic operation in the mid-to-high speed range	Main jet obstructed.	Check and clean.
	Build-up sticking to tapered needle.	Check and clean.
	Throttle valve malfunctioning.	Check throttle valve operation.
	Filter obstructed.	Inspect and clean.
Erratic overflow and fuel level	Needle valve worn or damaged.	Replace.
	Float is malfunctioning.	Check and adjust.
	Debris build-up on needle valve.	Clean.
	Fuel level too high or too low.	Adjust float height.
	Carburetor breather hose obstructed.	Clean.
	Needle valve spring broken. .	Replace

9.1.3. RADIATOR

Trouble	Symptom and possible causes	Remedy
Engine overheats	Coolant insufficient.	Top up.
	Radiator fins obstructed by dirt or debris.	Clean.
	Thermostat faulty, jammed in the closed position.	Replace.
	Coolant passages obstructed.	Clean.
	Air in the cooling circuit.	Bleed the circuit.
	Coolant pump faulty.	Replace.
	Coolant used does not meet specification.	Change coolant.
Engine will not warm up to regular operating temperature	Thermostat faulty, jammed in the fully open position.	Replace.
	Very low ambient temperature.	Fit cowl to radiator.

9.1.4. ELECTRICAL SYSTEM

Trouble	Symptom and possible causes	Remedy
Spark plugs develop exceeding carbon build-up too quickly	Carburetion too rich.	Adjust carburetor.
	Idling speed set too high.	Adjust carburetor.
	Fuel does not meet specification.	Change fuel.
	Air cleaner dirty.	Clean.
	Spark plug heat rating too low.	Replace with a higher rating spark plug.
Spark plugs become foul too quickly	Piston rings worn.	Replace.
	Piston or cylinder worn.	Replace.
Spark plug electrodes overheated or burnt out	Spark plug heat rating too high.	Replace with lower rating spark plug.
	Engine overheats.	Adjust.
	Spark plug loose.	Tighten.
	Carburetion too lean.	Adjust carburetor.
Alternator does not charge battery	Connection terminals interrupted, shorted or loose.	Repair, replace or tighten.
	Generator coil shorted, discharging to earth or interrupted.	Replace.
	Regulator/rectifier shorted or faulty.	Replace.
Generator is undercharging the battery	Terminals have a tendency to short-circuiting, becoming interrupted or working themselves loose.	Repair or tighten.
	Generator stator coil discharging to earth or interrupted.	Replace.
	Regulator/rectifier faulty.	Replace.
	Faulty battery.	Replace.
Generator is overcharging the battery	Short circuit inside battery.	Replace the battery.
	Regulator/rectifier damaged or faulty.	Replace.
	Erratic regulator/rectifier ground.	Clean and tighten the ground terminals.
Charge unsteady	Terminal insulator worn due to vibration is causing transient short circuits.	Repair or replace.
	Short circuits inside generator.	Replace.
	Regulator/rectifier faulty.	Replace.

9.1.5. BATTERY

Trouble	Symptom and possible causes	Remedy
Battery runs flat quickly	Charge system faulty.	Check generator, regulator/rectifier, circuit connections and rectify to obtain proper charge
	Battery was overcharged and battery cells lost much of their active material.	Replace battery and repair charge system.
	Exceeding deposit build-up caused by wrong electrolyte leads to short-circuits in the battery.	Replace battery.
	Battery is due for replacement.	Replace battery.
Battery polarity reversal	Battery improperly connected to electrical system.	Replace battery; make sure to connect it properly.
Battery runs flat too fast	Dirt at top end and at the sides of the container.	Clean.
	Battery is due for replacement.	Replace battery.

9.1.6. BRAKES

Trouble	Symptom and possible causes	Remedy
Loss of braking	Brake hydraulic system leaking.	Repair or replace.
	Brake pads worn.	Replace.
	Contact surfaces of brake pads contaminated with oil.	Replace.
	Brake discs worn.	Replace.
	Air in the hydraulic circuit.	Bleed the circuit.
Brakes squeal	Contact surfaces of brake pads vitrified.	Sand brake pad surfaces.
	Brake pads inverted.	Install brake pads correctly.
	Wheel hub bearing damaged.	Replace.
	Front or rear wheel spindle loose.	Tighten to the specified torque.
	Brake pads worn.	Replace.
	Foreign matter suspended in brake fluid.	Change brake fluid.
	Return hole of master cylinder obstructed.	Dismantle and clean brake master cylinder.
Brake lever has exceeding travel	Air in the hydraulic circuit.	Bleed the circuit.
	Brake fluid level low.	Top up to specified level. Bleed the circuit.
	Brake fluid does not meet specification.	Change using specified brake fluid.
Brake fluid leakage	Fittings loose.	Tighten to the specified torque.
	Hoses cracked.	Replace.
	Piston and/or body damaged.	Replace piston and/or body.

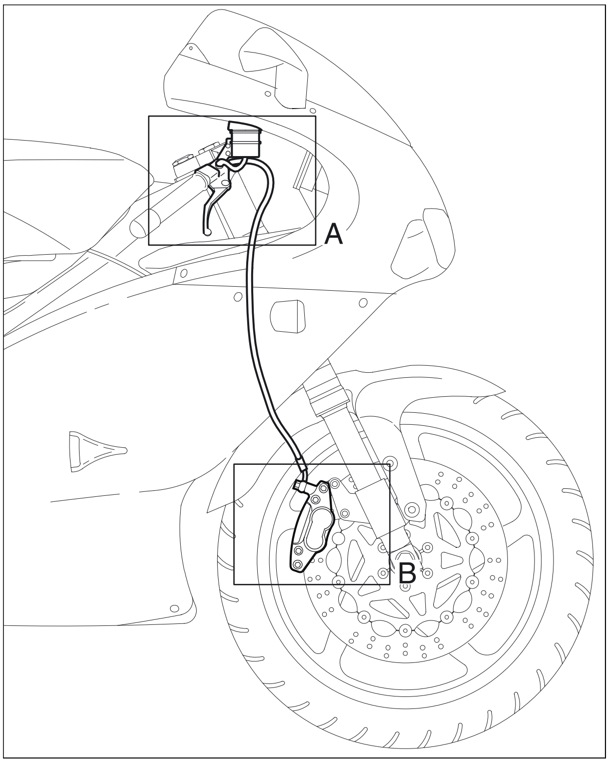
9.1.7. CHASSIS

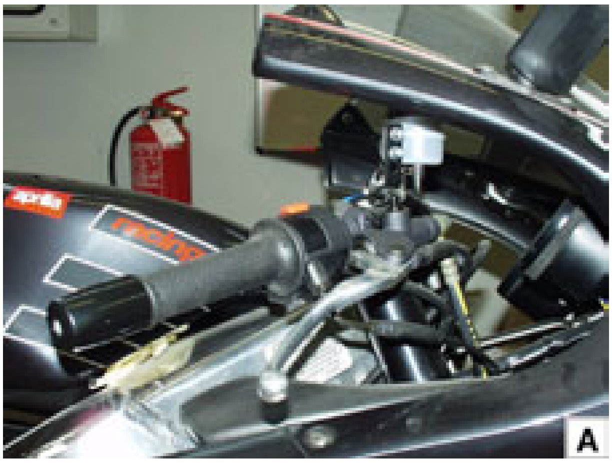
Trouble	Symptom and possible causes	Remedy
Hard steering	Steering adjusting ring nut overtightened.	Adjust.
	Steering bearing damaged.	Replace.
	Steering stem distorted.	Replace.
	Tyre underinflated.	Adjust.
Handlebars shake	Uneven front fork settings.	Adjust.
	Front fork buckled.	Replace.
	Front wheel rim and/or tyre warped.	Replace.
Front wheel wobbles	Wheel rim warped.	Replace.
	Front wheel hub bearings worn.	Sostituire.
	Tyre defective or does not meet specification.	Replace.
	Wheel spindle nut loose.	Tighten.
	Front fork oil does not meet specification.	Adjust.
Front fork too soft	Springs yielded.	Replace.
	Front fork oil level low. .	Top up
Front fork too stiff	Front fork oil does not meet specification (viscosity too high).	Replace.
	Front fork overfilled.	Remove excess oil.
Front fork is noisy	Front fork oil level low.	Top up.
	Suspension nuts loose.	Tighten.
Rear wheel wobbles	Wheel rim warped.	Replace.
	Wheel hub bearings or swinging arm bearings worn.	Replace.
	Tyre defective or does not meet specification.	Replace.
	Swinging arm and shock absorber bearings worn.	Replace.
	Rear suspension bolts or nuts loose.	Tighten.
Rear suspension too soft	Shock absorber spring yielded.	Replace.
	Adjuster incorrectly set.	Adjust.
	Perdita d'olio dall'ammortizzatore.	Sostituire.
Rear suspension too stiff	Adjuster incorrectly set.	Adjust.
	Shock absorber pivot bolt distorted.	Replace.
	Swinging arm distorted. .	Replace.
	Swinging arm and shock absorber bearings worn.	Replace.
Rear suspension noisy	Rear suspension bolts or nuts loose.	Tighten.
	Swinging arm and shock absorber bearings worn.	Replace.

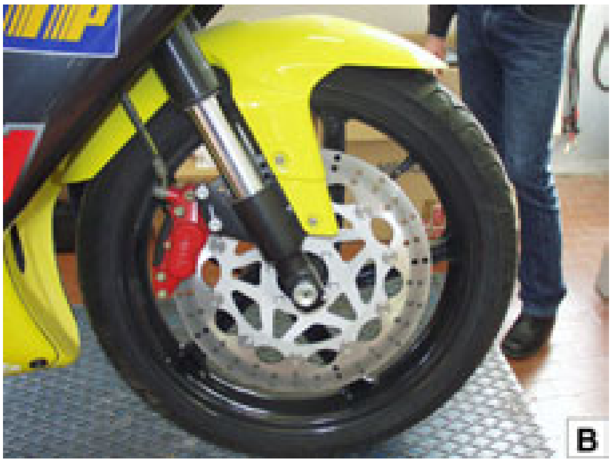
9.2. HOSE ROUTING

9.2.1. ROUTING AND CONNECTIONS OF WIRING, CABLES AND HOSES

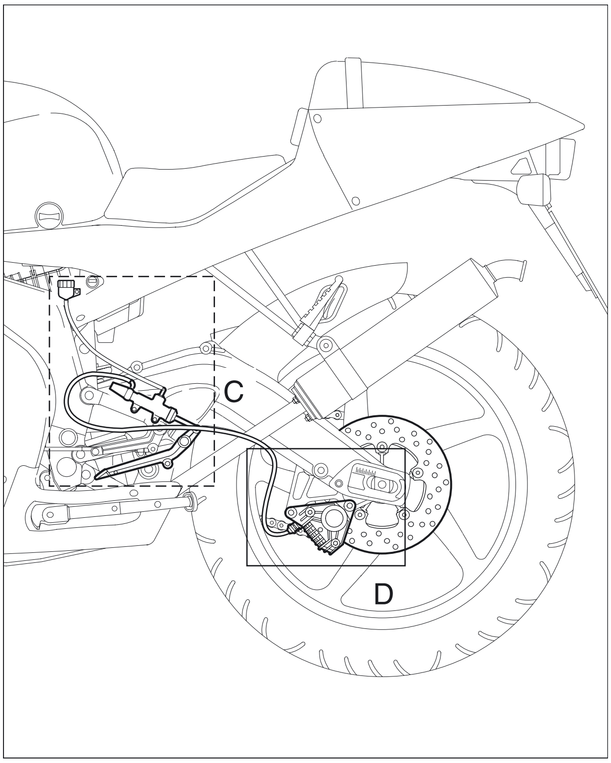
FRONT BRAKE HOSES

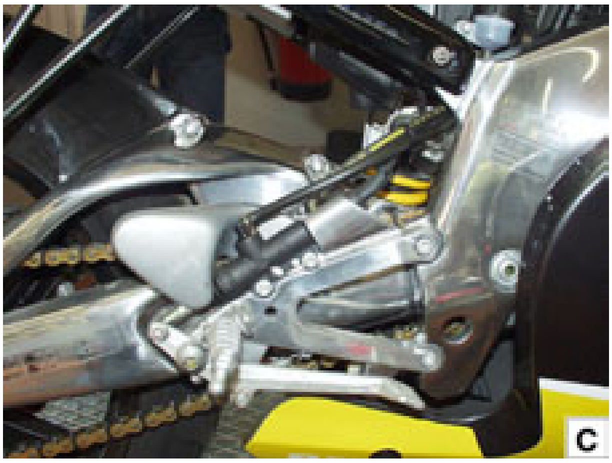


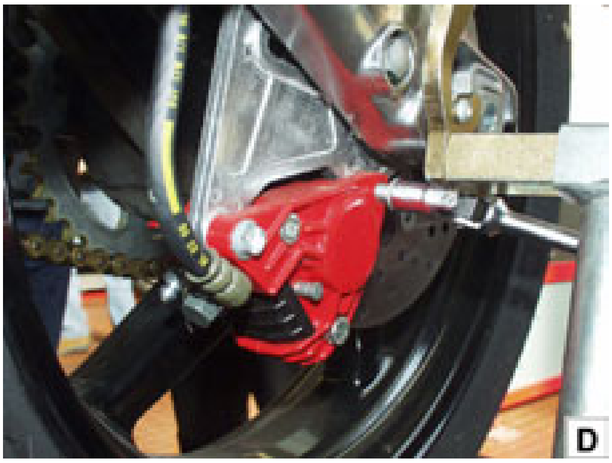




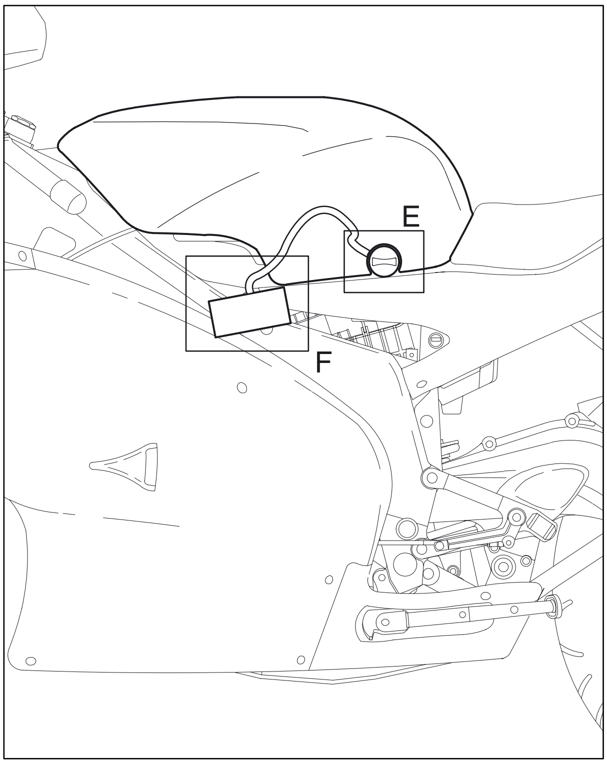
REAR BRAKE HOSES

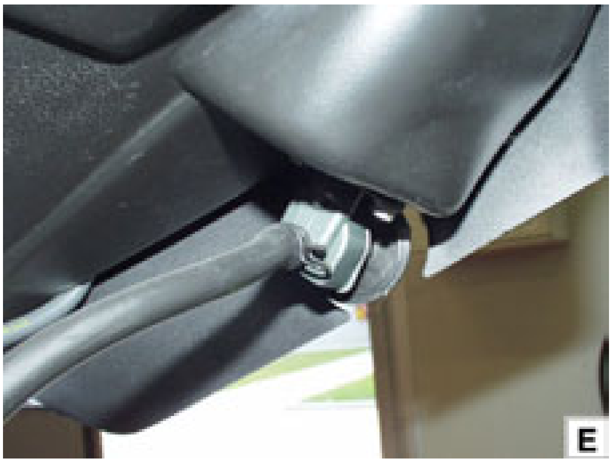


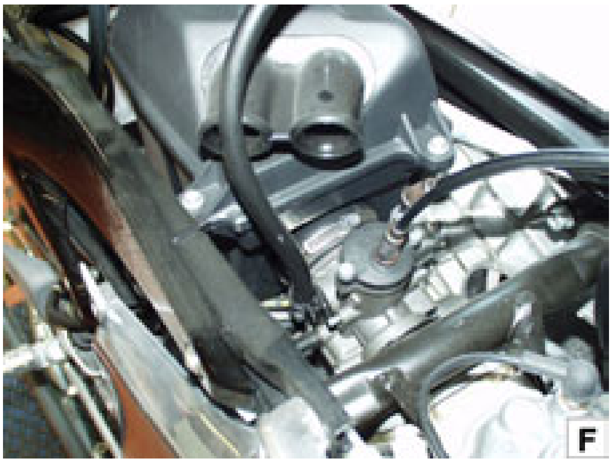




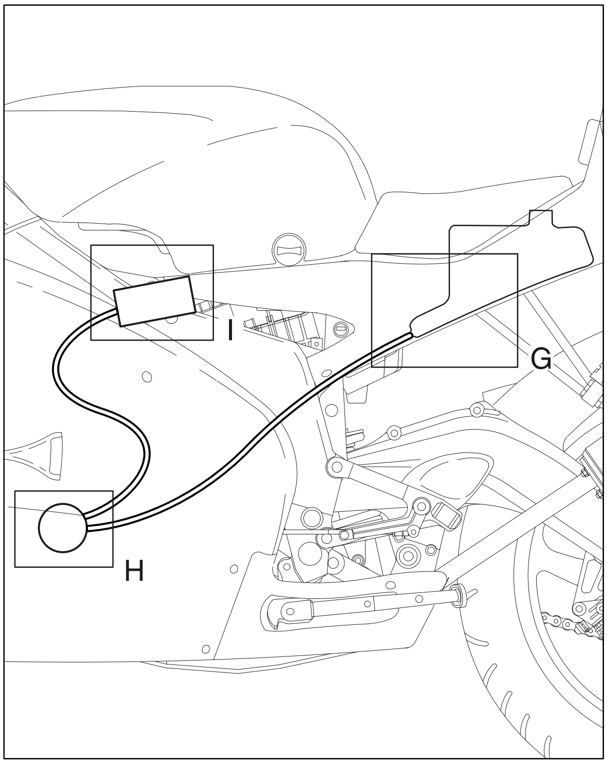
FUEL SYSTEM HOSES

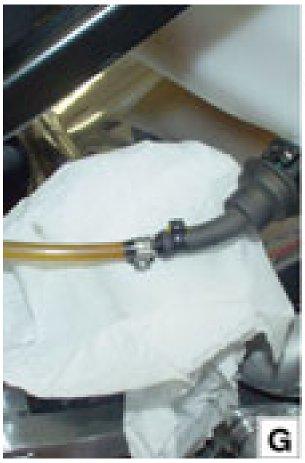


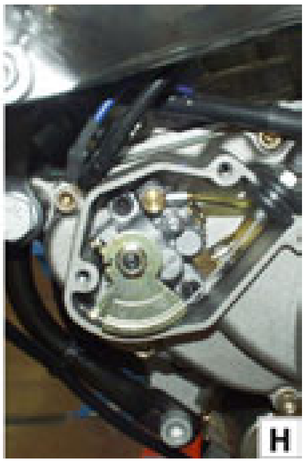


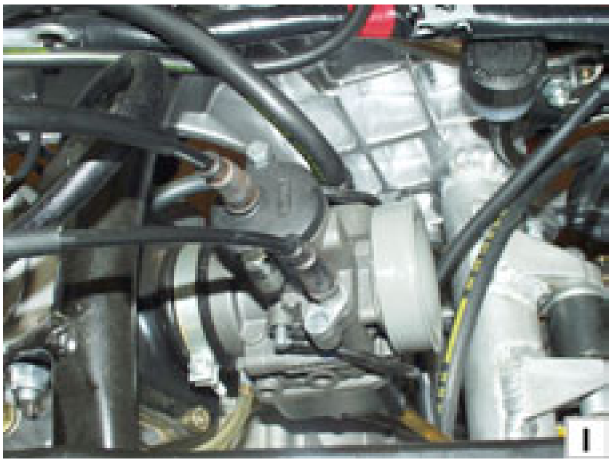


OIL TUBES

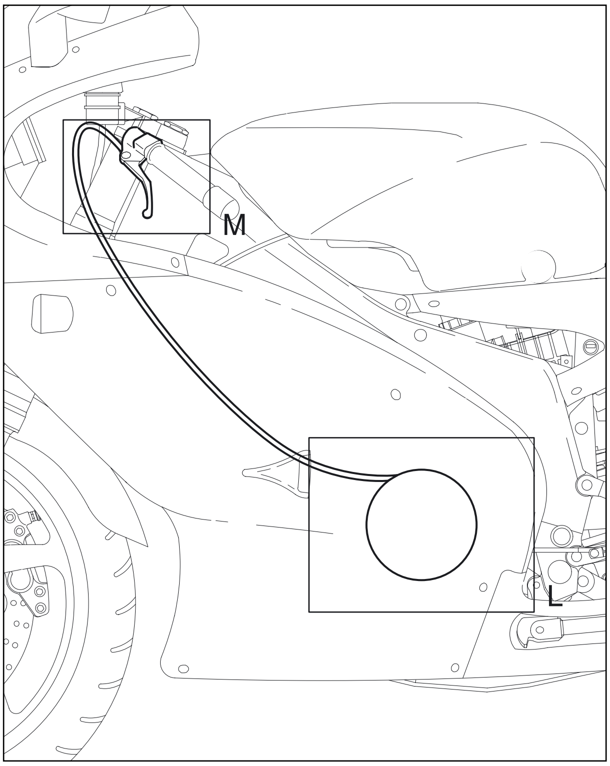




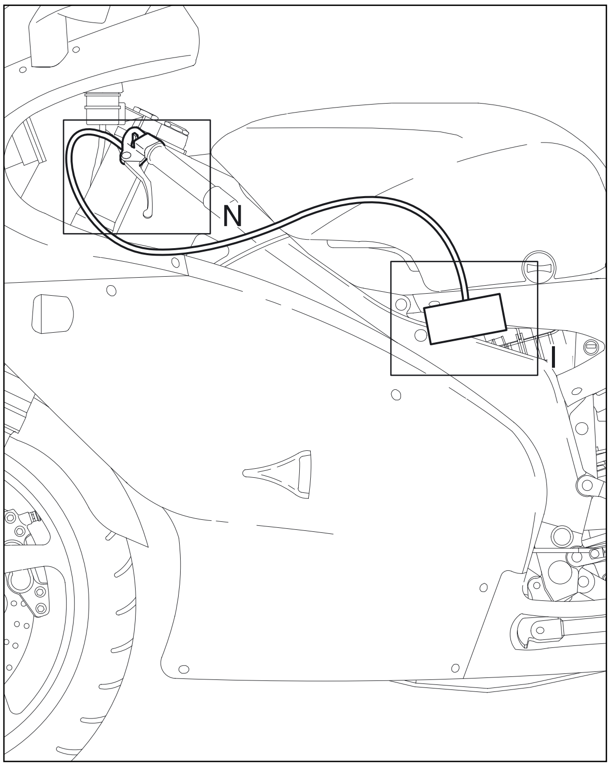


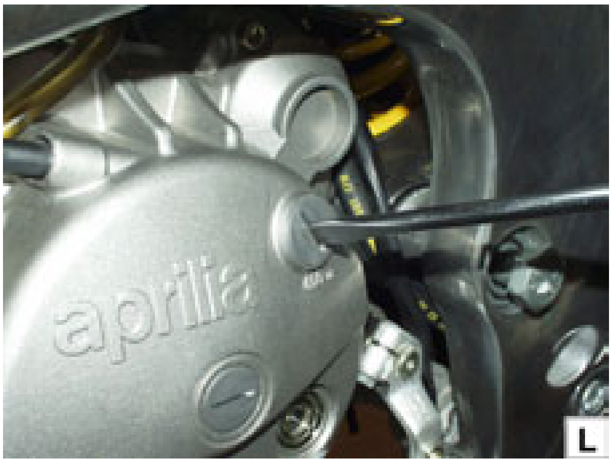


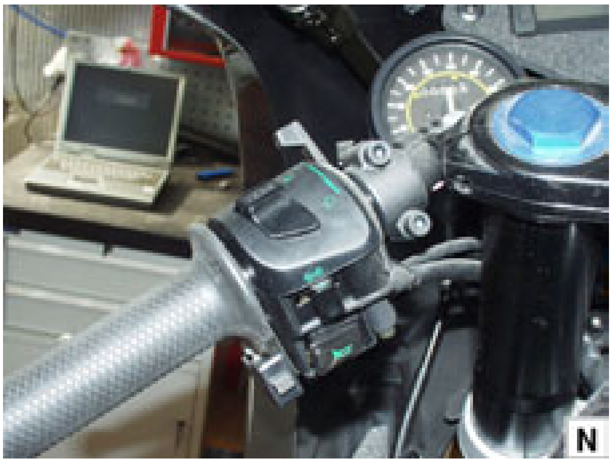
CLUTCH CABLE

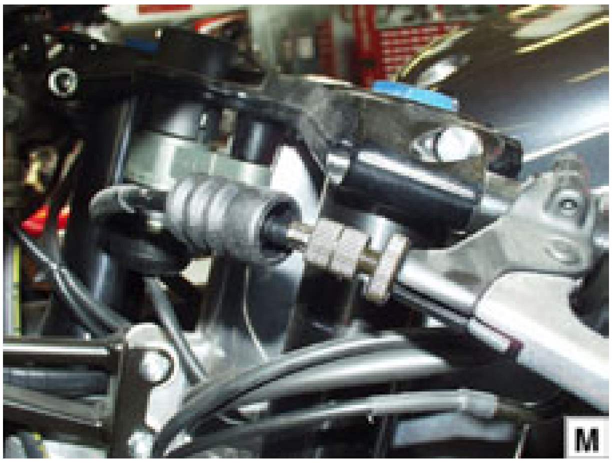


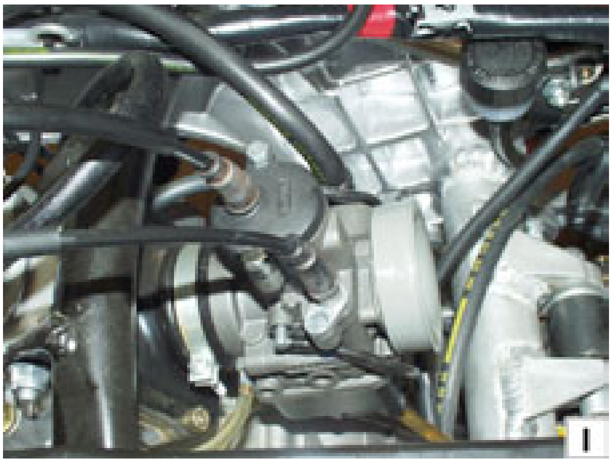
COLD-START CABLE











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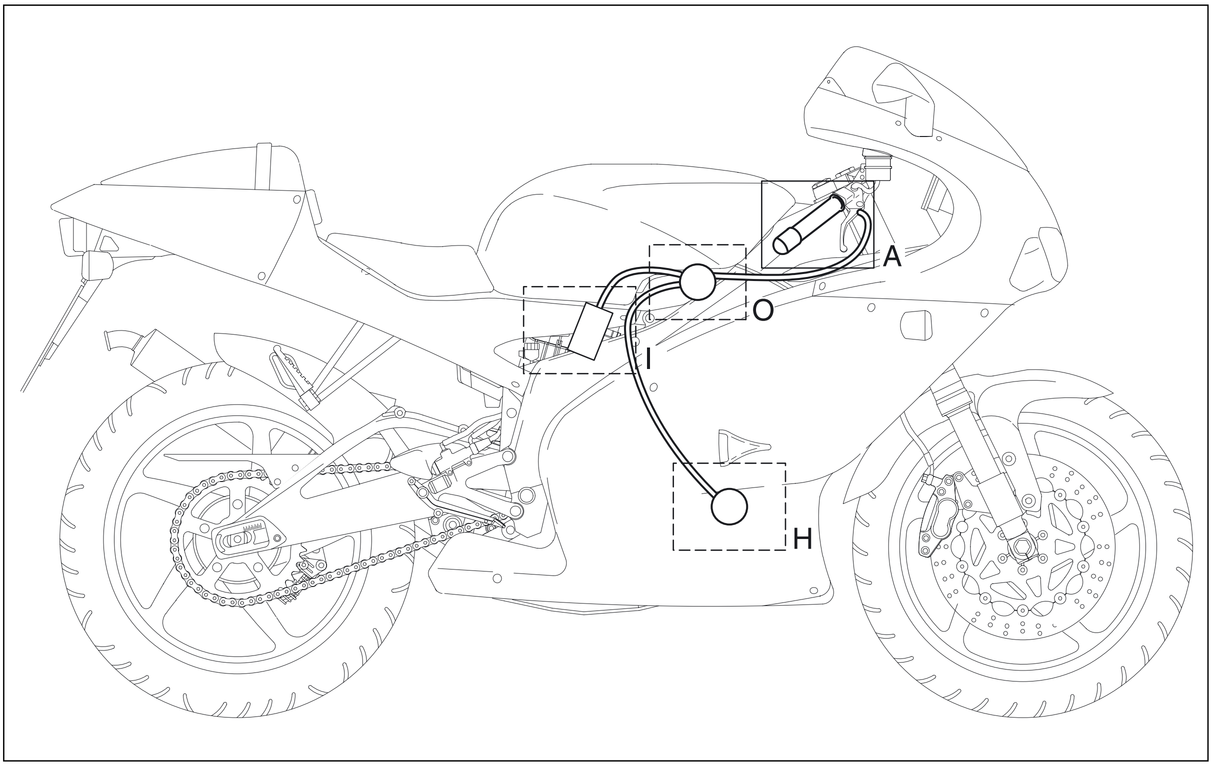
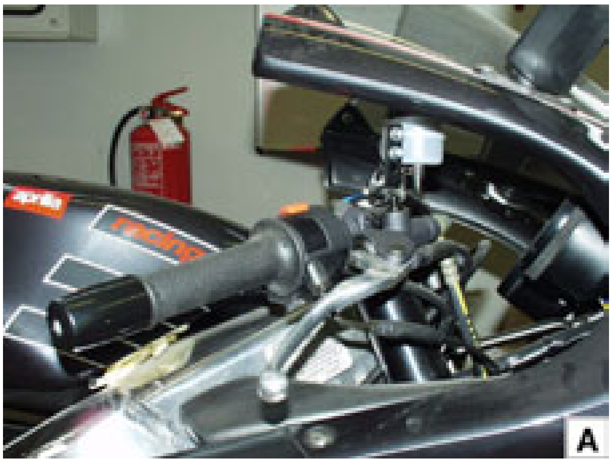
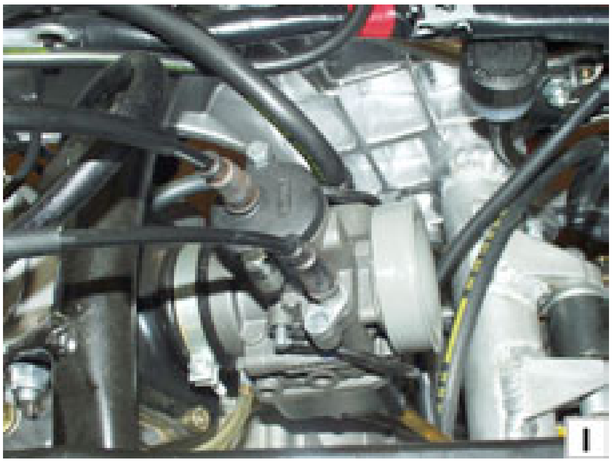
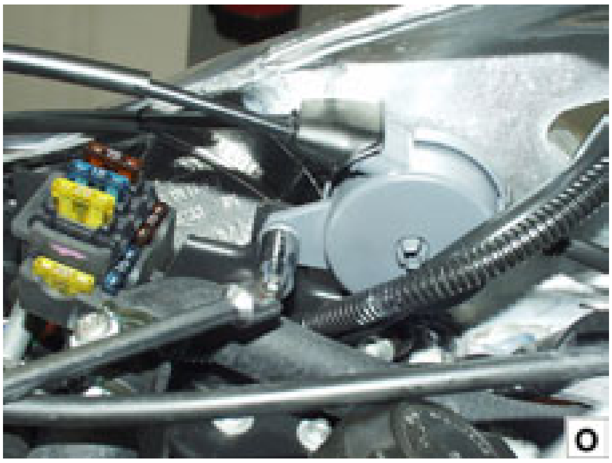
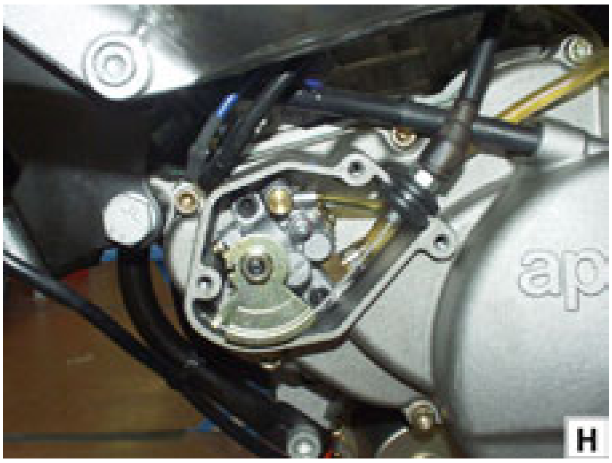


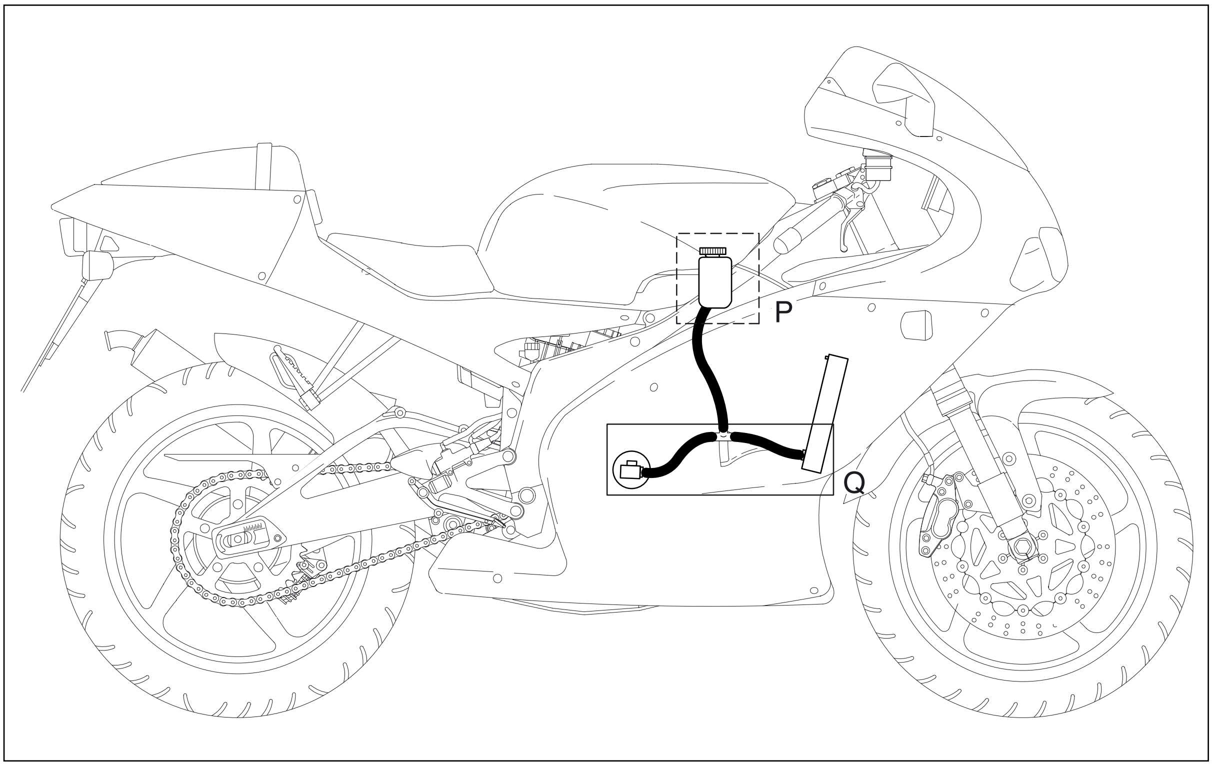


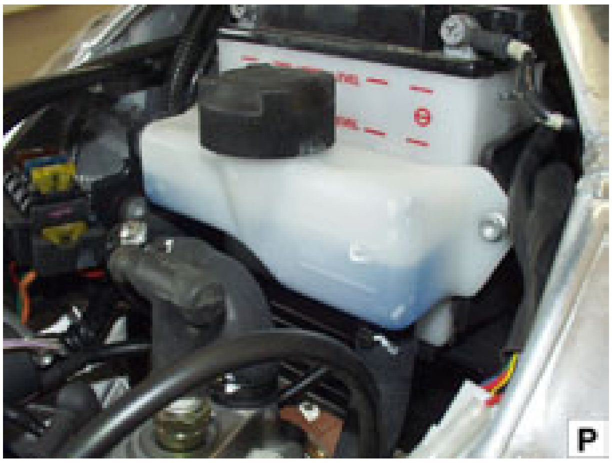


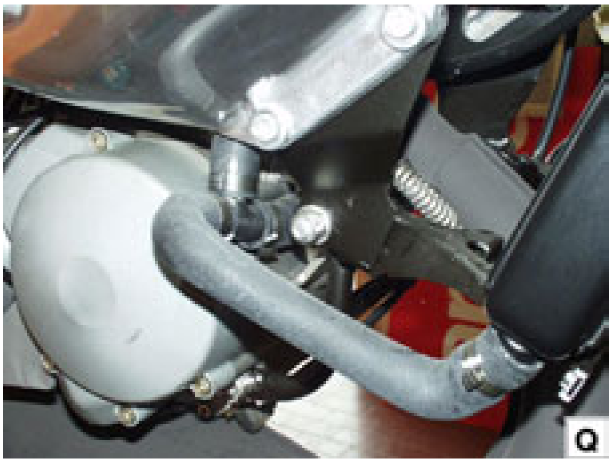


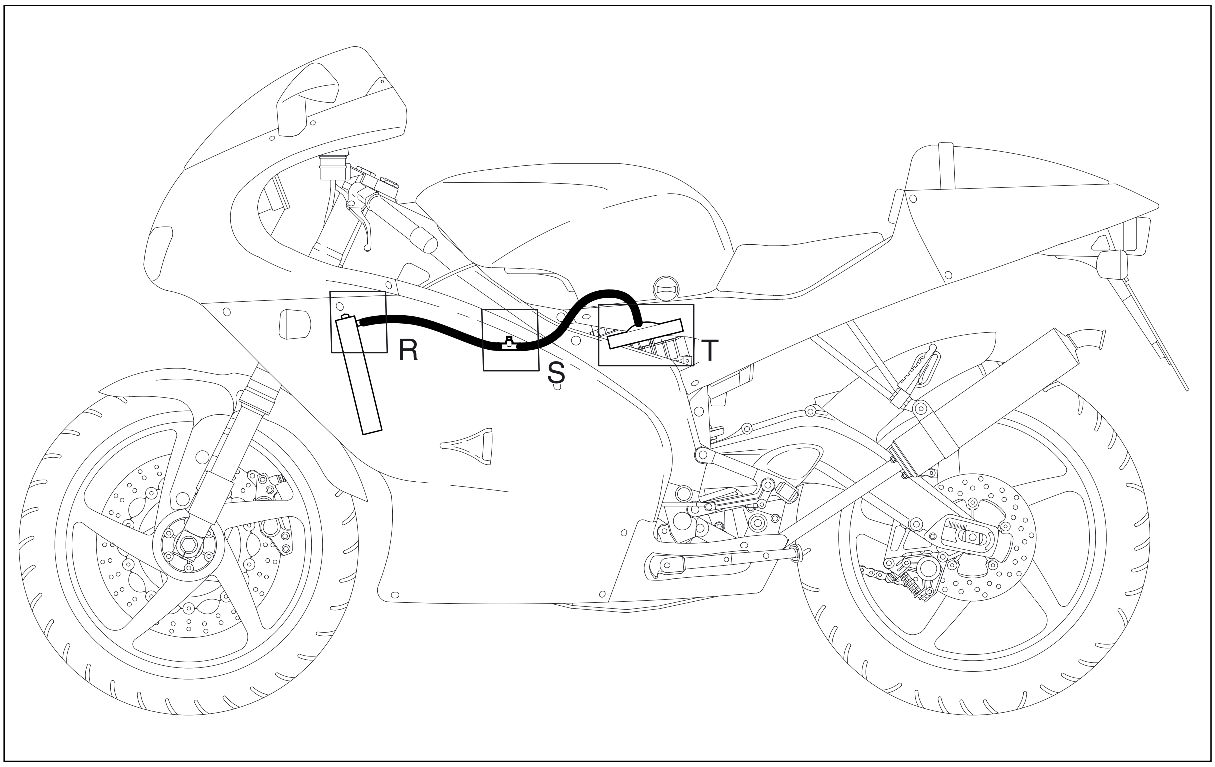


COOLING SYSTEM





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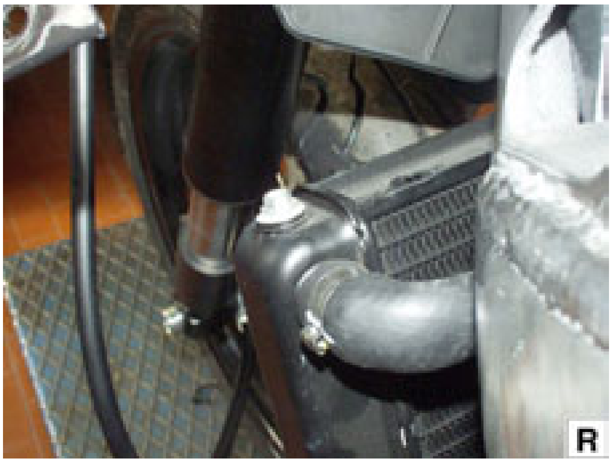
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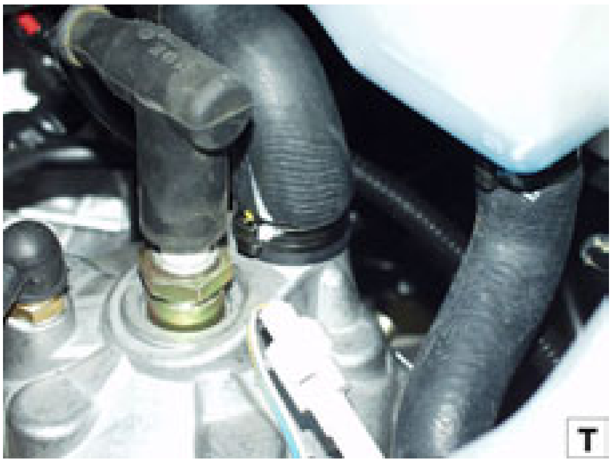
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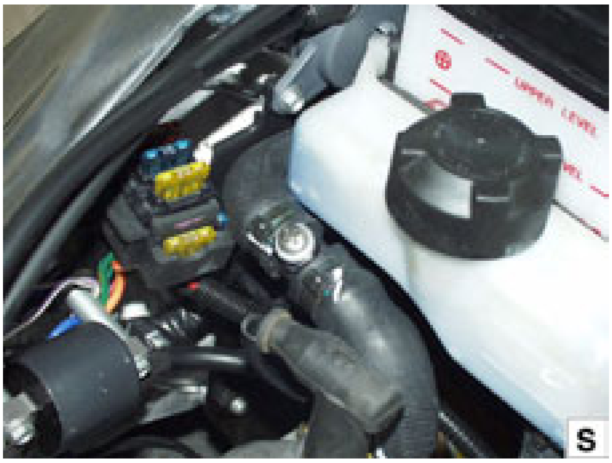
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